GALATA YAYINLARI

YÖS

Yeni Tarz Sorular | New Style Questions

MATEMATİK 2
Mathematics

Soru Bankası / Question bank

İÇİNDEKİLER

ÜNİTE 1

Unit 1

Polinom / Polynomial

1. **Aşağıda verilen fonksiyonlardan hangileri polinomdur?**

Which of the following functions are polynomial?

I. $f(x) = x^2 + 5x - 3$

II. $g(x) = \sqrt{x} + 7$

III. $h(x) = \sqrt{2} \cdot x + 3$

IV. $t(x) = 0$

A) f(x) B) f(x), t(x) C) t(x)

D) f(x), h(x), t(x) E) h(x), t(x)

2. $P(x) = x^{\frac{6}{n}} - 2x^{n-4} + 58$

P(x) polinom ise n kaçtır?

If P(x) is a polynomial what is the value of n?

A) 12 B) 6 C) 3 D) 2 E) 1

3. $P(x) = 8 \cdot x^{n-5} + 3x^{8-n} + 1$

P(x) polinom ise n kaç farklı değer alır?

If P(x) is a polynomial how many different values could "n" take?

A) 6 B) 5 C) 4 D) 3 E) 2

4. $P(x) = 2x^8 + 9x^3 - 5$

der [P(x)] = ?

A) 9 B) 8 C) 5 D) 2 E) – 5

5. $P(x) = x^{\frac{7n+10}{n}} + x^2 + 5$

P(x) polinom ise n kaç farklı değer alır?

If P(x) is a polynomial how many different values could "n" take?

A) 8 B) 4 C) 3 D) 2 E) 1

6. $P(x) = 4x + k - 1$

$P(1) = 13$

⇒ k = ?

A) 10 B) 8 C) 6 D) 5 E) 4

7. $P(2x + 1) = x^2 + x + 1$

⇒ P(1) + P(7) = ?

A) 60 B) 45 C) 30 D) 15 E) 14

8. $P(x^3) = 5x^9 + x^6 - 3x^3 + 1$

⇒ P(2) = ?

A) 44 B) 40 C) 39 D) 38 E) 10

9. $P(x) = 3x^{a-b} + x^2 + x^{b-a} + 2$

P(x) polinom ise P(a – b + 1) = ?

P(x) is a polynomial P(a – b + 1) = ?

A) 3 B) 5 C) 6 D) 7 E) 10

10. $P(x^2) = (m - 3)x^5 + (m - 1)x^4 + 3$

P(x) bir polinom ise P(– 2) = ?

P(x) is a polynomial P(– 2) = ?

A) 35 B) 33 C) 22 D) 20 E) 11

11. $P(x) = x^3 + 3x^2 + 3x + 3$

⇒ $P(\sqrt[3]{7} - 1) = ?$

A) 10 B) 9 C) 8 D) 7 E) 6

12. $P(x) = (b + 2)x^2 + (a - b + 5)x + a \cdot b$

P(x) polinomu sabit bir polinom belirttiğine göre, P(2020) değeri kaçtır?

As the polynomial of P(x) is a constant polynomial, what is the value of P(2020)?

A) 2020 B) 14 C) 7 D) – 7 E) – 14

13. $P(x, y) = x^2 - 2xy + y^2$

⇒ **P(37, 27) = ?**

A) 370 B) 120 C) 100 D) 37 E) 27

14. $P(x - 2) = 2x^2 + 3x - 4$

P(5x – 3) polinomunun katsayılar toplamı kaçtır?

What is the sum of coefficients of P(5x – 3) polynomial?

A) 40 B) 38 C) 35 D) 33 E) 30

15. $P(x + 2) = 3x^2 + 12x + 1$

⇒ $P(\sqrt{3}) = ?$

A) – 2 B) 0 C) 1 D) 2 E) $\sqrt{3}$

16. $P(3x - 2) = x^3 - 3x^2 - 4$

P(x + 1) polinomunun sabit terimi kaçtır?

What is the constants term of P(x + 1) polynomial?

A) – 4 B) – 9 C) – 8 D) – 7 E) – 6

1-D 2-B 3-C 4-B 5-B 6-A 7-E 8-C 9-D 10-E 11-B 12-B 13-C 14-A 15-A 16-E

1. $A, B \in R$

$$\frac{6x-10}{x^2-6x+5} = \frac{A}{x-5} + \frac{B}{x-1}$$

$\Rightarrow$ **A = ?**

A) 6 B) 5 C) 4 D) 2 E) 1

2. $P(x) + Q(x) = x^5 - x^4 - 2x + 5$

$Q(-x) = -x^5 - 2x^4 - x + 3$

$\Rightarrow$ **P(x) = ?**

A) $x^4 - 3x + 2$ B) $-x^4 - 3x + 2$

B) $x^4 + 3x - 2$ D) $-x^4 + 3x + 1$

E) $-x^4 + 3x + 2$

3. $\boxed{1} \rightarrow 3$

$\boxed{2} \rightarrow 7$

$\boxed{3} \rightarrow 13$

$\vdots$

$\boxed{x} \rightarrow P(x)$

$\Rightarrow$ **P(x) + P(** $\boxed{2}$ **) = ?**

A) $x^2 + x + 8$ B) $x^2 - x - 8$

B) $x^2 - x + 58$ D) $x^2 + x + 11$

E) $x^2 + x + 58$

4. $P(x) = Ax^3 + Bx^2 + Cx + D$

$P(1) = P(3) = P(-1) = 0$

$P(0) = 3$

$\Rightarrow$ **P(2) = ?**

A) 3 B) 2 C) – 2 D) – 3 E) – 1

5. $(3x-1)^4 = Ax^4 + Bx^3 + Cx^2 + Dx + E$

$\Rightarrow$ **A + C + E = ?**

A) 130 B) 134 C) 136 D) 140 E) 150

6. $P(x) = (x+2)^4 + 3(x+1)^3$

$P(x) = a_4 . x^4 + a_3 . x^3 + a_2 . x^2 + a_1 . x + a_0$

$\Rightarrow$ **a_1 = ?**

A) 41 B) 39 C) 37 D) 35 E) 33

7. $a, b \in Z^+$

$P(x) = (x+a) \cdot (x+b)$

$P(1) = 15$

$\Rightarrow$ **a + b = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

8. $P(x) = 3x^2 + mx + n$

$P(1) - P(0) = 2$

$\Rightarrow$ **P(2) – P(1) = ?**

A) 9 B) 8 C) 6 D) 5 E) 4

9. $(x^2 + 1)^4 . (x + 1)^2 = ax^9 + bx^8 + \ldots + mx^4 + \ldots + k$

$\Rightarrow$ **m = ?**

A) 5 B) 10 C) 15 D) 20 E) 25

10. $\text{der}\left[P(x) . Q(x)\right] = 10$

$\text{der}\left[\dfrac{P(x)}{Q(x)}\right] = 4$

$\Rightarrow$ **$\text{der}\left[x^2 . P(x) + x . Q(x)\right]$ = ?**

A) 13 B) 11 C) 9 D) 8 E) 7

11. Pozitif katsayılı P(x) polinomu

P(x) positive coefficient polynomial

$P(x) . P(3x) = 12x^2 - 8x + 1$

$\Rightarrow$ **P(x) = ?**

A) 2x + 1 B) x + 2 C) x – 2 D) 2x – 1 E) 2x – 2

12.

$$\begin{array}{r|l} x^6 - 3x^3 + a & x - 1 \\ \hline - & \\ \hline 0 & \end{array}$$

$\Rightarrow$ **a = ?**

A) – 2 B) – 1 C) 0 D) 1 E) 2

13. $\text{der}\left[P(x)\right] = 3$

$\Rightarrow$ **$\text{der}\left[P^2(x^3)\right]$ = ?**

A) 81 B) 18 C) 12 D) 8 E) 3

14. $P(x) = 2x^{10} - x^5 + k$

$$\begin{array}{r|l} P(x) & x^5 - 3 \\ \hline - & \\ \hline 4 & \end{array}$$

$\Rightarrow$ **k = ?**

A) 11 B) 5 C) 3 D) – 11 E) – 21

15. P(x) polinom,

P(x) polynomial

$P(x) = x^3 - 2x^2 + \dfrac{a + 1}{x}$

$\Rightarrow$ **P(a) = ?**

A) 3 B) 1 C) – 3 D) – 1 E) 0

1-B 2-A 3-E 4-D 5-C 6-A 7-A 8-B 9-B 10-C 11-D 12-E 13-B 14-D 15-C

1. $3x^3 - 2x^2 + x + 1 \equiv P(x) \ [\text{mod}(x^2 + 1)]$

$\Rightarrow$ **P(x) = ?**

A) $-2x - 3$ B) $-2x + 3$ C) $2x - 3$ D) $2x + 3$ E) 1

2. $\text{der}[P(x)] = 5$

$\text{der}[Q(x)] = 7$

$\Rightarrow$ **der** $[x^2 . P(x) + x . Q(x^2)] = ?$

A) 14 B) 15 C) 16 D) 17 E) 18

3. $\forall x \in R$

$3x - 5 = a(x^2 - 1) + bx(x - 1) - c(x + 1)$

$\Rightarrow$ **a + b + c = ?**

A) 1 B) 3 C) 4 D) 5 E) 7

4.

$$\begin{array}{r|l} P(x) & x^9 - x + 1 \\ \hline - & B(x) \\ \hline K(x) & \end{array}$$

$\text{der}[B(x)] = \text{der}[K(x)] - 1$

$\Rightarrow$ **max** $[P(x)] = ?$

A) 24 B) 23 C) 17 D) 16 E) 15

5. $P(x) = 2x^2 - x + 5$

$\Rightarrow$ **$P(x^2)$ = ?**

A) $4x^4 - x^2 + 5$ B) $2x^4 + x^2 + 5$

C) $2x^4 - x^2 + 5$ D) $4x^4 + x^2 + 5$

E) $x^4 - x^2 + 5$

6. $P(x^2 + x + 1) = 3x^2 + 3x + 5$

$\Rightarrow$ **P(20) = ?**

A) 60 B) 61 C) 62 D) 63 E) 65

7. $(x^2 - 1) . Q(x + 1) = x^3 + mx + n$

$$\begin{array}{r|l} x^2 - 1 & Q(x) \\ \hline & B(x) \end{array}$$

$\Rightarrow$ **B(x) = ?**

A) x B) x + 1 C) x - 1 D) x + 2 E) x - 2

8. $P(x) = (x + 2)^{2020} - 2(x + 2)^{2019}$

$$\begin{array}{r|l} P(x) & x \\ \hline & B(x) \end{array} \qquad \begin{array}{r|l} B(2x + 5) & 2x - 2 \\ \hline - & \\ \hline K & \end{array}$$

$\Rightarrow$ **K = ?**

A) 7^{2020} B) 7^{2019} C) 5^{2019} D) 9^{2019} E) 3^{2019}

9. $x > 6$

$P(x) = (654321)_x - (1234)_x$

$\Rightarrow$ **P(1) = ?**

A) 0 B) 2 C) 8 D) 10 E) 11

10. $\dfrac{P(x) + x}{Q(x-1) + 2} = x^2 - 3x$

P(x) polinomunun katsayılar toplamı 13 ise Q(x) polinomunun sabit terimi kaçtır?

If the sum of the coefficients of P(x) is 13 what is the constant term of Q(x) polynomial?

A) – 9 B) – 7 C) – 4 D) – 2 E) – 1

11. $P(x) = 3x^3 + a$

$Q(x) = (b-2)x^3 + (c+1)x^2 - 4$

$P(x) = Q(x)$

$\Rightarrow$ **a + b + c = ?**

A) 5 B) 4 C) 1 D) 0 E) – 1

12. $P(x) = x^2 - 2x + 1$

$Q(x) = 2x^2 - 3x - 1$

$P(x) + R(x) = 2Q(x)$

$\Rightarrow$ **R(x) = ?**

A) $3x^2 - 4x$ B) $3x^2 - 3$ C) $3x^2 - 4x - 3$

D) $3x^2 + 4x - 3$ E) $3x^2 - 8x - 3$

13. $P(x) = 2x^2 - x$

$Q(x) = x^3 + 1$

$\Rightarrow$ **P(1) . Q(1) = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

14. $P(2x-5) - P(3x-4) = x^2 + x + 1$

$\Rightarrow$ **P(1) – P(5) = ?**

A) 15 B) 14 C) 13 D) 12 E) 11

15. $P(x) = (x^5 + 4x^4 - 2x^3 + 3) \,.\, (-x^4 + 2x^3 - 3x^2 + 5)$

$Q(x) = a_9 \,.\, x^9 + a_8 \,.\, x^8 + \ldots + a_1 \,.\, x + a_0$

$P(x) = Q(x)$

$\Rightarrow$ **a_6 = ?**

A) 16 B) 14 C) – 12 D) – 14 E) – 16

16.

$$\begin{array}{r|l} 2x^4 - 3x^3 + 2x + 5 & x^2 - 1 \\ - & \hline & B(x) \\ \hline & K(x) \end{array}$$

$\Rightarrow$ **B(x) + K(x) = ?**

A) $2x^2 - 3x + 2$ B) $2x^2 - 4x + 9$ C) $7 - x$

D) $2x^2 - 5x + 1$ E) $2x^2 + 2x - 3$

1-B 2-B 3-A 4-D 5-C 6-C 7-B 8-D 9-E 10-A 11-D 12-C 13-D 14-C 15-E 16-B

1. $P(x) = x^{2020!} + 2x^9 - 5$

$Q(x) = x^2 - x + 1$

$P(x) \mid Q(x)$

$-$

K

$\Rightarrow$ **K = ?**

A) – 8 B) – 6 C) – 2 D) – 1 E) 0

2. $\dfrac{a^8 + 4a^2 - 8}{a^2 + 2} = ?$

A) $a^6 - a^5 - 4a^4 - 4$ B) $a^6 - 3a^4 - 4$

C) $a^6 - 2a^4 + 4a^2 - 4$ D) $a^6 - 2a^4 + 4a^2 - 3$

E) $a^6 - 3a^3 + 1$

3. $P(x) = 2x^2 + mx + 4$

$P(x_1) = P(x_2) = 0$

$x_1 \neq x_2 \quad x_1 + x_2 = 2 \cdot x_1 \cdot x_2$

$\Rightarrow$ **m = ?**

A) – 2 B) – 4 C) – 6 D) – 8 E) – 10

4. $P(x, y) = x^5 + 2x^3y^3 + 3x^2 - 4y^4$

$\Rightarrow$ **der [P(x, y)] + P(1, 0) = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

5. $P(x) = x \cdot (x + 3)^3 \cdot (x + 5)^5$

$Q(x) = x^2 \cdot (x + 3) \cdot (x + 5)^3$

$\Rightarrow \dfrac{\text{EKOK(P(x), Q(x))}}{\text{EBOB(P(x), Q(x))}} = ?$

A) $x \cdot (x + 3)^2 \cdot (x + 5)^2$ B) $x^2 \cdot (x + 3)$

C) $x^2 \cdot (x + 3) \cdot (x + 5)$ D) $x \cdot (x + 3)$

E) $x \cdot (x + 3) \cdot (x + 5)^2$

6. $P(x) = ax^2 + bx + c$

$A = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$

$a \in A \quad b \in A \quad c \in A$

$P\left(-\dfrac{2}{3}\right) = 0$

$\text{der}[P(x)] = 2$

kaç farklı P(x) polinomu yazılabilir?

How many different P(x) polynomials can be written?

A) 7 B) 6 C) 5 D) 4 E) 3

7. $P(x) = (x + 1) + (x + 2) + (x + 3) + \ldots + (x + 19)$

$Q(x) = (x + 1) + (x + 2) + \ldots + (x + 5)$

$P(x) \mid Q(x)$

$-$

K

$\Rightarrow$ **K = ?**

A) 19 B) 20 C) 133 D) 134 E) 190

8. $Q(x+2) = ax^2 + bx + c$

$Q(x+3) = x^5 + 3x^4 - 6$

$\Rightarrow$ **a + b + c = ?**

A) 6 B) 5 C) – 5 D) – 6 E) – 1

9. $P(x) = Ax^3 + Bx^2 + Cx + D$

$P(1) = 1$ $P(2) = 3$

$P(3) = 5$ $P(4) = 6$

$\Rightarrow$ **P(7) = ?**

A) 7 B) – 7 C) 3 D) – 3 E) 9

10. $P(x) = x^6 - 16x^5 - 18x^4 + 18x^3 - 15x^2 - 34x + 3$

$P(x+5) \mid x-12$

$-$

K

$\Rightarrow$ **K = ?**

A) 0 B) 1 C) 2 D) 3 E) 12

11. $P(-x) = -P(x)$

$P(x) \mid x-2$

$-$

4

$P(x) \mid x^2-4$

$-$

$K(x)$

$\Rightarrow$ **K(x) = ?**

A) 2x – 4 B) 2x + 4 C) 2x

D) 2x – 5 E) 2x + 5

12. $P(x) = 1 + x + x^2 + x^3 + \ldots + x^{2019}$

$P(x^2 - x) \mid x^2 - x + 1$

$-$

K

$\Rightarrow$ **K = ?**

A) – 2 B) – 1 C) 0 D) 1 E) 2

13. $P(x) = x^3 + ax^2 + bx + 4$

$P(x) \mid (x+1)^2$

$-$

$3x - 1$

$\Rightarrow$ **a + b = ?**

A) 1 B) 5 C) 7 D) 14 E) 21

14. $P(x) = (x+1)^4 + (1-x)^4 + x^4$

$i = \sqrt{-1}$

$\Rightarrow$ **P(i) = ?**

A) – 7 B) – 6 C) 1 + i D) i E) 4i

15. $P(x) = (1+x)(1+x^2)(1+x^4)(1+x^8)$

$\Rightarrow$ **6 . P(7) + 1 = ?**

A) 7^6 B) 7^{16} C) 16^8 D) 8^{16} E) 0

1-B 2-C 3-D 4-E 5-A 6-A 7-C 8-D 9-B 10-D 11-C 12-C 13-E 14-A 15-B

TEST 5

1. $P(x) \mid x + 5$ with remainder 1; $P(x) \mid x + 2$ with remainder 7; $P(x) \mid x^2 + 7x + 10$ with remainder $K(x)$

$\Rightarrow$ **K(x) = ?**

A) $2x - 3$ B) $x + 4$ C) $x - 1$ D) $3x + 16$ E) $2x + 11$

2. $P(x - 1) + P(x + 1) = 4x^2 - 2x + 10$

$\Rightarrow$ **P(x) = ?**

A) $2x^2 - x + 3$ B) $2x^2 + x + 3$ C) $4x^2 - 1$ D) $4x^2 + 1$ E) $5x^2 + 1$

3. $P(ax + b) = a - bx$

$\Rightarrow$ **P(0) = ?**

A) $\frac{a^2 + b^2}{b}$ B) $2a + b$ C) $\frac{a^2 + b^2}{a}$ D) $\frac{a^2 - b^2}{a}$ E) $\frac{a^2 - b^2}{b}$

4. $P(x) + P(2x) + P(3x) = 14x^2 + 3$

$\Rightarrow$ **P(x) = ?**

A) x^2 B) $2x^2 + 1$ C) $x^2 + 3$ D) $x^2 + 1$ E) $x^2 - 3$

5. $\frac{P(2x + 1)}{Q(x - 3)} = x^2 + x + 1$

$P(x) \mid x - 9$ with remainder K; $Q(x) \mid x - 1$ with remainder 7

$\Rightarrow$ **K = ?**

A) 149 B) 147 C) 21 D) 19 E) 10

6. $P(x) = x^3 + x^2 + 4 \Rightarrow P'(x) = 3x^2 + 2x$

$Q(x) + Q'(x) = (x + 1)^2$

$\Rightarrow$ **Q(10) = ?**

A) 11 B) 101 C) 1001 D) 25 E) 1

7. $P(x) \mid x - 1$ with remainder -4; $Q(x) \mid x - 1$ with remainder 6; $3P(x) + t.Q(x) \mid x - 1$ with remainder 0

$\Rightarrow$ **t = ?**

A) -3 B) -2 C) 1 D) 2 E) 3

8. $(x^2 - 1)(px^2 + qx + r) + 3x + 5 = P(x)$

$Ax^4 + Bx^3 + Cx^2 + Dx + E = Q(x)$

$P(x) = Q(x)$

$\Rightarrow$ **A + C + E = ?**

A) 10 B) 8 C) 5 D) 4 E) 0

9. $P(x) = x^4 + ax^3 + bx^2 + cx + d$

$P(-i) = P(2i) = 0$

$\Rightarrow$ **P(0) = ?**

A) 2 B) 4 C) 5 D) 6 E) 7

10. $P(x) = x^2 - 47x + 53$

$P(x) \mid x - m$ with remainder 0

$P(x) \mid x - n$ with remainder 0

$\sqrt{a + \sqrt{4b}} = \sqrt{m} + \sqrt{n}$

$\Rightarrow$ **$b^2 - a^2$ = ?**

A) 6 B) 47 C) 80 D) 530 E) 600

11. P(x) bir polinom,

$P(P(x)) = 9x + 28$

P(x) aşağıdakilerden hangisi olabilir?

If P(x) is a polynomial, which of the following can be the value of P(x)?

A) 2x + 7 B) x + 7 C) 3x + 1 D) 3x + 7 E) 2x + 15

12. $P(x) = x^3 + ax^2 + 5x + b$

$Q(x) = x^2 + x$

$P(x) \mid Q(x)$ with remainder $12x - 3$

$\Rightarrow$ **a − b = ?**

A) − 4 B) − 3 C) − 2 D) − 1 E) 0

13. $P(x) = 2x^3 - x + 8$

$P(x - 2) = x \cdot Q(x + 1)$

$\Rightarrow$ **Q(3) = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

14. $P(x - 1) + P(x) = 6x - 5$

$\Rightarrow$ **P(5) = ?**

A) 11 B) 12 C) 13 D) 14 E) 15

15. $(x - 2) \cdot P(x) = x^3 + mx^2 + x + 2$

$\Rightarrow$ **P(2) = ?**

A) − 1 B) 0 C) 1 D) 2 E) 3

1-E 2-A 3-C 4-D 5-B 6-B 7-D 8-C 9-B 10-E 11-D 12-B 13-E 14-D 15-C

TEST 6

1. $P(2x + 1) - P(x + 2) = ax^2 - x - 3$

$\Rightarrow$ **P(11) − P(7) = ?**

A) 92 B) 93 C) 94 D) 95 E) 96

2. $P(x) = (a - 2)x^3 + 5x^2 + bx + a + 1$

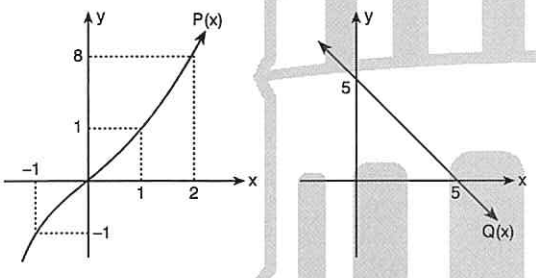
$\text{der}[P(x)] = 2$

ise P(x) polinomunun sabit terimi kaçtır?

If P(x) is a polynomial, what is the constants term of P(x) polynomial?

A) 1 B) 2 C) 3 D) 4 E) 5

3.



P(x)	Q(x)
−	
K	

$\Rightarrow$ **K = ?**

A) 125 B) 25 C) 5 D) 1 E) 0

4. $P(x) = x^3 + x + 2P(1)$

$\Rightarrow$ **P(3) = ?**

A) 8 B) 16 C) 20 D) 26 E) 32

5. $P(x) = x^{2020} - x^{2019}$

$P(2) \equiv m \pmod 5$

$\Rightarrow$ **m = ?**

A) 0 B) 4 C) 3 D) 2 E) 1

6. $P(x) = x^2 - 4x + m + 2$

$P(x_1) = P(x_2) = 0$

$x_1 = x_2$

$\Rightarrow$ **P(m) = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

7. $(3x - 2)^3 = ax^3 + bx^2 + cx + d$

$\Rightarrow$ **a + b + c = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

8. $P(x) = x + 1$

$Q(x) = x^2$

$\Rightarrow$ $\mathbf{P^2(Q(1)) + Q^2(P(2)) = ?}$

A) 11 B) 12 C) 13 D) 85 E) 86

9. $P(x)$ divided by $x^2 - 2x$: quotient $Q(x)$, remainder $4x + 1$

$P(x)$ divided by $x - 2$: quotient $B(x)$

$\Rightarrow$ **B(x) = ?**

A) $x \cdot Q(x) - 4$

B) $x \cdot Q(x)$

C) $x \cdot Q(x) + 4$

D) $x \cdot Q(x) - 2$

E) $x \cdot Q(x) + 2$

10. $P\left(x + \frac{1}{x}\right) = \frac{x}{x^2 + 1}$

$\Rightarrow$ $\mathbf{P\left(\frac{1}{5}\right) + P(3^{-2}) = ?}$

A) 12 B) 13 C) 14 D) 15 E) 16

11. $P(x) = ax^2 + bx + c$

$P(1) = P(2) = 0$

$\Rightarrow$ $\mathbf{\frac{c}{b} = ?}$

A) $\frac{2}{3}$ B) $\frac{3}{2}$ C) 1 D) $-\frac{3}{2}$ E) $-\frac{2}{3}$

12. $(x^2 + 1) \cdot P(x) = ax^3 + (b - 2)x + a - 1$

$\Rightarrow$ **a + b = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

13. $P(x) + P(x^2) + P(x^3) + \ldots + P(x^{17}) = x^{17} - 4x + 54$

$\Rightarrow$ **P(− 1) = ?**

A) 17 B) 15 C) 11 D) $\frac{11}{3}$ E) $\frac{17}{3}$

14. $2x^3 + 4x^2 + 3x + 3 = (x + 3) \cdot (ax^2 + bx + c)$

$\Rightarrow$ **a − b + c = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

15. P(x) polinomunun $x^2 + 2$ ile bölümünden kalan $x - 1$ ve Q(x) polinomunun $x^2 + 2$ ile bölümünden kalan $x - 3$ olduğuna göre,

$x^2 \cdot P(x) - x \cdot Q^2(x)$

polinomunun $x^2 + 2$ ile bölümünden kalan kaçtır?

If the remainder of the polynomial P(x) dividing by x^2+2 is $x - 1$ and remainder of the polynomial Q(x) dividing by $x^2 + 2$ is $x - 3$, then what is the remainder of the polynomial $x^2 \cdot P(x) - x \cdot Q^2(x)$ dividing by $x^2 + 2$?

A) $-9x - 10$ B) $-9x + 10$ C) $-9x + 7$

D) $2x + 10$ E) 0

1-A 2-C 3-A 4-D 5-C 6-A 7-B 8-D 9-C 10-C 11-E 12-B 13-D 14-B 15-A

TEST 7

1. P(2x – 1) polinomunun katsayılar toplamı 3a – 7,

P(x + 1) polinomunun sabit terimi a + 1 ise a = ?

The sum of coefficients of P(2x – 1) polynomial is 3a – 7, the constant term of P(x + 1) polynomial is a + 1

$\Rightarrow$ **a = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

2. $(x^2 - x + 2)^4 = a_8 \cdot x^8 + a_7 \cdot x^7 + \ldots + a_2 \cdot x^2 + a_1 \cdot x + a_0$

$\Rightarrow$ **$a_8 + a_6 + a_4 + a_2$ = ?**

A) 100 B) 108 C) 110 D) 120 E) 136

3. $(x^2 - 2x) \cdot (x+1)^3 = a_5 \cdot x^5 + a_4 \cdot x^4 + a_3 \cdot x^3 + a_2 \cdot x^2 + a_1 \cdot x + a_0$

$\Rightarrow$ **$a_1 + a_3 + a_5$ = ?**

A) – 8 B) – 6 C) – 4 D) – 2 E) – 1

4. $P(x) = x^4 + 2x^3 - x^2 + 3x - 1$

$Q(x) = x^2 + 1$

$P(x) \,|\, Q(x)$ — $B(x)$

$B(x) \,|\, x - 2$ — K

$\Rightarrow$ **K = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

5. $P(x, y) = 2x^2 + 2y^2 - 4xy - 3x + 3y - 3$

P(x, y) polinomunun (x – y + 4) ile bölümünden kalan kaçtır?

What is the remainder of the polynomial P(x, y) dividing by (x – y + 4)?

A) 37 B) 38 C) 39 D) 40 E) 41

6. $P(x) = 3x^{36} - 5x^{18} - 2$

P(x) polinomunun $(x^9 + \sqrt{3})$ ile bölümünden kalan kaçtır?

What is the remainder of the polynomial P(x) dividing by $(x^9 + \sqrt{3})$?

A) 8 B) 9 C) 10 D) 11 E) 12

7. $P(x) = x^3 + ax^2 + bx + c$

$P(1) = P(3) = P(5) = 7$

$\Rightarrow$ **P(0) = ?**

A) – 8 B) 8 C) – 4 D) 4 E) 1

8. $P(x) = 3x^2 + mx + n$

$P(1) - P(0) = 2$

$\Rightarrow$ **P(2) – P(1) = ?**

A) 7 B) 8 C) 9 D) 10 E) 11

9. a ve b tam sayı,

$P(x) = x^2 - 2x + a$

$Q(x) = x^2 + 3x + b$

$P(x_1) = P(x_2) = Q(x_1) = 0$

⇒ **a + b = ?**

A) – 6 B) – 5 C) – 4 D) – 3 E) – 2

10. $P(x) = 1 + x + x^2 + x^3 + \ldots + x^{50}$

$P(x) \mid x - 1$

$\quad\mid B(x)$

⇒ **B(1) = ?**

A) 1326 B) 1275 C) 1150 D) 50 E) 0

11. $P(x) = 2x^3 + ax^2 + bx + c + 1$

$P(x) \mid x^2 - 1$

$\quad\mid B(x)$

$-$

$B(x)$

⇒ **b + c = ?**

A) – 2 B) – 1 C) 0 D) 1 E) 2

12.

$P(x) \mid x + 1$

$-$

0

$P(3x + 8) \mid Q(x)$

$-$

0

⇒ **Q(x) = ?**

A) x + 1 B) x + 2 C) x + 3 D) x – 2 E) x – 3

13. $P(x) = (x + 7)^{-n} + (x + 8)^{-n} - 1$

P(x) polinomunun (x + 7) . (x + 8) ile tam bölünmesi için n için aşağıdakilerden hangisi doğrudur?

The polynomial of P(x) to be completely divided with (x + 7) . (x + 8) which on of the following is true for "n"?

A) $n = 2k,\ k \in Z$ B) $n = 2k + 1,\ k \in Z$

C) $n = 2k,\ k \in Z^+$ D) $n = 2k,\ k \in Z^-$

E) $n = 2k - 1,\ k \in Z^-$

14.

$A(x) \mid B(x)$

$\vdots \mid x + 1$

$-$

3

$B(x) \mid C(x)$

$\vdots \mid x - 2$

$-$

2

$A(x) \mid (x + 1) \cdot (x - 2)$

$\vdots$

$-$

$D(x)$

⇒ **D(x) = ?**

A) 2x + 7 B) 2x + 5 C) 2x + 3 D) 2x – 1 E) 2x – 3

15.

$P(x) \mid x^2 - x - 2$

$-$

$2x + 3$

$P^2(x) \mid x^2 - x - 2$

$-$

$K(x)$

⇒ **K(x) = ?**

A) 16x + 17 B) 15x + 10 C) 3 D) x + 1 E) x– 1

16. $n > 1,\ n \in N$

$P(x) = x^{n+1} + x^{n-1} - 10x^5$

$P(x) = (x - 3) \cdot Q(x)$

⇒ **n = ?**

A) 5 B) 6 C) 7 D) 10 E) 12

1-B 2-D 3-C 4-A 5-E 6-C 7-A 8-B 9-D 10-B 11-B 12-C 13-D 14-B 15-A 16-B

ÜNİTE 2

Unit 2

II. Dereceden Denklemler / Quadratic Equations

1. $x^2 - ax + x = 0$

S.S. = $\{0, 4\}$

⇒ **a = ?**

A) 7 B) 5 C) 3 D) 1 E) 0

2. $x^2 - (m + 1)x + 4 = 0$

S.S. = $\{x_1, 2\}$

⇒ **m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

3. $\frac{1}{x^2} + \frac{4}{x} + 4 = 0$

⇒ **x = ?**

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) -1 D) 1 E) 4

4. $(1 - m)x^2 + 4x + m^2 - 4 = 0$

S.S. = $\{x_1, x_2\}$

$x_1 > 0 > x_2$

m hangi aralıkta değer alır?
Which interval will "m" be located in?

A) $(1, \infty)$ B) $(-1, 0) \cup (1, \infty)$ C) $(-2, 1) \cup (2, \infty)$

D) $(4, \infty)$ E) $(0, \infty)$

5. $mx^2 + (m \cdot n - 1)x - n = 0$

⇒ **S. S. = ?**

A) $\{-1, 1\}$ B) $\{m, n\}$ C) $\left\{\frac{1}{m}, \frac{1}{n}\right\}$

D) $\{m \cdot n, n\}$ E) $\left\{-n, \frac{1}{m}\right\}$

6. $\frac{x^2 + 3x + 2}{x^2 + 5x + 6} = 0$

⇒ **S. S. = ?**

A) $\{-1, -2\}$ B) $\{-2\}$ C) $\{-1\}$

D) $\{2\}$ E) $\{1, 2\}$

7. $\sqrt{x^2 - 5} - x = -5$

⇒ **S. S. = ?**

A) $\{3\}$ B) $\{1, 3\}$ C) $\varnothing$

D) $\{-5, 3\}$ E) $\{-1, 3, 5\}$

8. $x^2 - ax + 16 = 0$

S. S. = $\{x_1, x_2\}$

$\frac{1}{\sqrt{x_1}} + \sqrt{x_2} = 5$

⇒ **a = ?**

A) 5 B) 7 C) 15 D) 17 E) 20

9. $x^2 - 3x - 6 = 0$

S. S. = $\{x_1, a\}$

$\Rightarrow$ $a - \frac{6}{a} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

10. $k \in R^+$

$3x^2 + kx - 2 = 0$

S. S. = $\{x_1, k\}$

$\Rightarrow$ $x_1 = ?$

A) $-\frac{2\sqrt{2}}{3}$ B) $\frac{2\sqrt{2}}{3}$ C) 1 D) $-\frac{\sqrt{2}}{6}$ E) $\frac{\sqrt{2}}{6}$

11. $\frac{x+4}{x} + \frac{x}{2} = 4$

$\Rightarrow$ **S. S. = ?**

A) $\{2\}$ B) $\{2, 4\}$ C) $\{-2\}$

D) $\{-2, 4\}$ E) $\{-2, 2\}$

12. $8 \cdot x^{-6} + 7 \cdot x^{-3} = 1$

S. S. = $\{x_1, x_2\}$

$\Rightarrow$ $|x_1 - x_2| = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

13. $(x^2 - 3x)^2 - (x^2 - 3x) - 6 = 0$

S. S. = $\{x_1, x_2, x_3, x_4\}$

$\Rightarrow$ $\Sigma x = ?$

A) 2 B) 3 C) 6 D) 7 E) 8

14. $x^2 - 5x + 1 = 0$

S. S. = $\{x_1, x_2\}$

$\Rightarrow$ $(3 - x_1) \cdot (3 - x_2) = ?$

A) -5 B) -3 C) 1 D) 3 E) 5

15. $x^2 - 6x + a = 0$

denkleminin iki farklı kökü varsa "a" hangi aralıkta değer alır?

If the equation has two different roots, which interval will "a" be located in?

A) $(9, \infty)$ B) $(1, \infty)$ C) R

D) $(-3, 3)$ E) $(-\infty, 9)$

16. $4^x - 9 \cdot 2^x + 8 = 0$

S. S. = $\{x_1, x_2\}$

$\Rightarrow$ $\Pi x = ?$

A) 8 B) 5 C) 3 D) 1 E) 0

1-B 2-C 3-A 4-C 5-E 6-C 7-C 8-D 9-C 10-A 11-B 12-D 13-C 14-A 15-E 16-E

1. $a \in R$,

$ax^2 - 18x + 18 = 0$

S. S. $= \{x_1, x_2\}$

$x_1 = 2x_2$

$\Rightarrow$ **a = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

2. $x_1 + x_2 - x_1 \cdot x_2 = 7$

$x_1 + x_2 + 2x_1 \cdot x_2 = 1$

Buna göre, kökleri x_1 ve x_2 olan denklem aşağıdakilerden hangisidir?
According to the information above which on of the following is the equation which includes x_1 and x_2 roots?

A) $x^2 - 9 = 0$ B) $x^2 - 3x = 0$ C) $x^2 - 7x - 3 = 0$
D) $x^2 - 5x - 2 = 0$ E) $x^2 + 1 = 0$

3. $x^2 - 2x - 4 = 0$

S. S. $= \{m_1, m_2\}$

Buna göre, kökleri $(1 + m_1)$ ve $(1 + m_2)$ olan denklem aşağıdakilerden hangisidir?
Acoording to the information above which on of the following is the equation which includes $(1 + m_1)$ and $(1 + m_2)$ roots?

A) $x^2 - 4x - 1$ B) $x^2 + 4x - 1$ C) $x^2 - 4x + 1$
D) $x^2 + 4x + 1$ E) $x^2 - 4x + 2$

4. $(a + 1)x^3 + x^{b-2} + 3x + 4 = 0$

ifadesi ikinci dereceden bir bilinmeyenli denklem ise a . b kaçtır?

If the expression above is a quadratic equation then what is the value of a . b?

A) – 8 B) – 6 C) – 5 D) – 4 E) – 2

5. $(n + 1)x^2 - 4x + 1 = 0$

S. S. $= \{x_1, x_2\}$

$x_1 = x_2$

$\Rightarrow$ **n = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

6. $x^2 + 3|x| - 4 = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{1\}$ B) $\{-1, 1\}$ C) $\{0, 1\}$
D) $\{-4, -1, 1, 4\}$ E) $\varnothing$

7. $m \neq n \neq 0$

$m, n \in R$

$x^2 + (m + 1)x + n - m = 0$

S. S. $= \{x_1, m - n\}$

$\Rightarrow \frac{n}{m} = ?$

A) 8 B) 6 C) 4 D) 3 E) 2

8. $(x-2)\,.\,(4x-5) = 2-x$

$\Rightarrow$ **S. S. = ?**

A) $\{2\}$ B) $\{1, 2\}$ C) $\{-2\}$ D) $\{-2, 2\}$ E) $\{1, 0\}$

9. $x^2 - 2x - 7 = 0$

S. S. $= \{x_1, m\}$

$\Rightarrow$ **$7 + 4m - 2m^2 = ?$**

A) -7 B) 7 C) -4 D) 4 E) 1

10. $\dfrac{2x-3}{x} + \dfrac{x}{2x-3} = 1$

$\Rightarrow$ **S. S. = ?**

A) $\{1\}$ B) $\{2\}$ C) $\varnothing$ D) $\{1, 2\}$ E) $\{-1, 2\}$

11. $\sqrt{x + 10 + \sqrt{x+6}} = 4$

$\Rightarrow$ **x = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

12. $\dfrac{3x-4}{4x-3} + \dfrac{2x-1}{x-1} = 1$

S. S. $= \{x_1, x_2\}$

$\Rightarrow$ **$\Pi x = ?$**

A) $-\dfrac{1}{2}$ B) -1 C) $\dfrac{4}{7}$ D) 2 E) 5

13. $x^4 - 14x^2 + 45 = 0$

S. S. $= \{x_1, x_2, x_3, x_4\}$

$\Rightarrow$ **$\Pi x = ?$**

A) 14 B) 24 C) 45 D) -45 E) -14

14. $2x^2 + (m+2)x + n - 1 = 0$

S. S. $= \{-3, 5\}$

$\Rightarrow$ **$m - n = ?$**

A) -35 B) -23 C) 35 D) 32 E) 23

15. $x^2 + 3x + n - 9 = 0$ S. S. $= \{a, b\}$

$x^2 - 8x + n + 2 = 0$ S. S. $= \{a, c\}$

$\Rightarrow$ **n = ?**

A) 1 B) 3 C) 5 D) 7 E) 9

1-C 2-D 3-A 4-D 5-E 6-B 7-E 8-B 9-A 10-C 11-B 12-C 13-C 14-E 15-C

1. I. $x^2 - x + 1 = 0$ S. S. = $\varnothing$

II. $x^2 - 2x - 1 = 0$ S. S. = $\{1 + \sqrt{2}, 1 - \sqrt{2}\}$

III. $x^2 - 8x + 16 = 0$ S. S. = $\{-4\}$

ifadelerinden hangileri doğrudur?
Which of the expressions above are true?

A) Yalnız I B) I ve III C) II ve III D) I ve II E) I, II ve III

2. $x^2 - 3x + m + 1 = 0$

S. S. = $\{x_1, x_2\}$

$x_1^2 - 2x_1x_2 - 3x_2^2 = 21$

$\Rightarrow$ **m = ?**

A) – 5 B) – 4 C) 4 D) 5 E) 74

3. $x^2 + (a + 1)x + b = 0$ S. S. = $\{6, x_2\}$

$x^2 - (c - 2)x + d = 0$ S. S. = $\{-3, x_2\}$

$\Rightarrow \frac{b}{d} + a + c = ?$

A) 10 B) 6 C) 0 D) – 6 E) – 10

4. $2x^2 - 10x + a = 0$

S. S. = $\{x_1, x_2\}$

$x_1 - x_2 = 1$

$\Rightarrow$ **a = ?**

A) 24 B) 12 C) 6 D) 3 E) 1

5. $x^2 - 5|x| + 6 = 0$

S. S. = $\{x_1, x_2, \ldots x_n\}$

$\Rightarrow$ **n = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

6. $m \neq 0$

$mx^2 - (1 + m^2)x + m = 0$

S. S. = $\{x_1, x_2\}$

$\Rightarrow$ **$x_1 . x_2$ = ?**

A) 0 B) 1 C) m D) m^2 E) m^3

7. $x^2 - (a - 2)x + a = 0$

S. S. = $\{x_1, x_2\}$

$x_1 = x_2$

$\Rightarrow$ **Σa = ?**

A) 20 B) 16 C) 8 D) 4 E) 1

8. $m \in Z$

$2x^2 - 5x + k = 0$

S. S. = $\varnothing$

$\Rightarrow$ **min(k) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

9. $\sqrt{x^2 + x + 1} = 1 - x - x^2$

$\Rightarrow \Sigma x = ?$

A) 3 B) 2 C) 0 D) – 2 E) – 1

10. $(2x^2 + 3x) \cdot (x^2 - 11x + 8) = 0$

S. S. $= \{x_1, x_2, x_3, x_4\}$

$\Rightarrow x_1 + x_2 + x_3 + x_4 = ?$

A) – 11 B) $-\frac{19}{2}$ C) $\frac{19}{2}$ D) 11 E) 0

11. $2x^2 + mx + 1 = 0$ S. S. $= \{x_1, x_2\}$

$2x^2 + mx - 2 = 0$ S. S. $= \left\{\frac{1}{x_1}, x_3\right\}$

$\Rightarrow \Pi m = ?$

A) – 9 B) –3 C) 0 D) 3 E) 9

12. $\sqrt{m \cdot \sqrt[5]{m}} - \sqrt[5]{m\sqrt{m}} = 56$

$\Rightarrow m = ?$

A) 5^6 B) 6^5 C) 2^5 D) 4^5 E) 5^4

13. $|x^2 - 16| = |x - 4|$

$\Rightarrow \Sigma x = ?$

A) – 8 B) – 6 C) – 4 D) 4 E) 8

14. $|x^2 - 7| = 5!$

$\Rightarrow \Pi x = ?$

A) 127 B) – 127 C) $\sqrt{127}$ D) $-\sqrt{127}$ E) 0

15. $|x + 2|^2 - 6|x + 2| - 7 = 0$

$\Rightarrow \Sigma x = ?$

A) 2 B) 1 C) 0 D) – 2 E) – 4

16. $|x - 3| = |2x - 9|$

$\Rightarrow \Pi x = ?$

A) 48 B) 24 C) – 24 D) – 48 E) – 12

1-D 2-A 3-E 4-B 5-E 6-B 7-C 8-D 9-E 10-C 11-A 12-D 13-C 14-B 15-E 16-B

1. $x^2 - 3x - 1 = 0$

S. S. $= \{x_1, x_2\}$

$\Rightarrow \mathbf{x_1^2 + \frac{1}{x_1^2} = ?}$

A) 11 B) 9 C) 7 D) 5 E) 1

2. $17.\left(\frac{34 + \sqrt{34^2 + 4.17.5}}{34}\right)^2 - 34.\left(\frac{34 + \sqrt{34^2 + 4.17.5}}{34}\right) = ?$

A) 5 B) 17 C) 34 D) 35 E) 85

3. $x^2 - 2x - 4 = 0$

S. S. $= \{x_1, x_2\}$

$\Rightarrow \mathbf{x_1 . (x_2 + 1) + x_2 = ?}$

A) 2 B) 1 C) 0 D) – 1 E) – 2

4. $x^2 - 4x + n + 1 = 0$

S. S. $= \{x_1, x_2\}$

$2x_1 - x_2 = 5$

$\Rightarrow \mathbf{n = ?}$

A) 4 B) 3 C) 2 D) 1 E) 0

5. $a, b, c \in Q$

$ax^2 + bx + c = 0$

S. S. $= \{x_1, 3 - \sqrt{2}\}$

$\Rightarrow \mathbf{x_1 . (3 - \sqrt{2}) = ?}$

A) 9 B) 7 C) 5 D) 3 E) $\sqrt{2}$

6. $x^2 - 6x + 3 - m = 0$

S. S. $= \{x_1, x_2\}$

$\frac{1}{x_1} + \frac{1}{x_2} = \frac{3}{2}$

$\Rightarrow \mathbf{m = ?}$

A) 2 B) 1 C) 0 D) – 1 E) – 2

7. $x^2 - (x_1 + 2)x + 3x_2 = 0$

$x_1 \neq 0 \quad x_2 \neq 0$

S. S. $= \{x_1, x_2\}$

$\Rightarrow \mathbf{x_1^2 + x_2^2 = ?}$

A) 5 B) 12 C) 13 D) 14 E) 20

8. $x^2 - 4x - 2 = 0$

S. S. $= \{x_1, x_2\}$

$\Rightarrow \mathbf{\frac{6}{(x_1)^2 - 4x_1} + \frac{4}{4x_2 - (x_2)^2} = ?}$

A) 5 B) 4 C) 3 D) 2 E) 1

9. $x \cdot (x+1) \cdot (x+2) \cdot (x+3) = 24$

S. S. $= \{x_1, x_2\}$

$\Rightarrow$ **$x_1 \cdot x_2 = ?$**

A) -24 B) -4 C) 1 D) 4 E) 24

10. $x^2 - ax + x - 10 = 0$

S. S. $= \{x_1, x_2\}$

$x_1^2 \cdot x_2 + x_1 \cdot x_2^2 = 30$

$\Rightarrow$ **$a = ?$**

A) 2 B) 1 C) 0 D) -1 E) -2

11. $x^2 + (n-1)x - 7 = 0$

S. S. $= \{x_1, x_2\}$

$x_1^2 + x_2^2 = 15$

$\Rightarrow$ **$\Sigma n = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

12. $x^2 - 2x = 4$

S. S. $= \{x_1, x_2\}$

$\Rightarrow$ **$x_1^3 + x_2^3 = ?$**

A) 32 B) 34 C) 36 D) 42 E) 48

13. $x^2 + 3x + n - 8 = 0$

S. S. $= \{x_1, x_2\}$

$x_1^2 + 4x_1 + x_2 = 9$

$\Rightarrow$ **$n = ?$**

A) 3 B) 4 C) -4 D) -3 E) -2

14. $x^2 - 5x + 2m - 6 = 0$

S. S. $= \{2k, 3k\}$

$\Rightarrow$ **$m = ?$**

A) 2 B) 3 C) 6 D) 8 E) 10

15. $2x^3 + 9x = 8x^2 + 3$

S. S. $= \{1, a, b\}$

$\Rightarrow$ **$a + b = ?$**

A) 3 B) 2 C) 1 D) $\frac{3}{2}$ E) -3

16. $x^2 - (a+1)x + 24 = 0$

S. S. $= \{x_1, x_2\}$

$x_1, x_2 \in Z$

Buna göre, m kaç farklı değer alabilir?

If $x_1, x_2 \in Z$ how many different values could "m" take?

A) 4 B) 5 C) 6 D) 7 E) 8

1-A 2-A 3-E 4-C 5-B 6-D 7-C 8-E 9-B 10-E 11-C 12-A 13-C 14-C 15-A 16-E

TEST 5

1. $ax^2 + bx + c = 0$

S. S. = $\{m, 2m\}$

olduğuna göre, a, b, c için aşağıdakilerden hangisi doğrudur?

Which of the followings expression of "a, b, c" is correct?

A) $4b^2 = 9c$ B) $2b^2 = 9ac$ C) $2b^2 = 9a$

D) $b^2 + 8ac = 0$ E) $9b^2 = 2a$

2. $\frac{a}{x+1} + \frac{b}{x} = 1$

S. S. = $\{x_1, 4 - x_1\}$

⇒ **a + b = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

3. $x^4 - 5x^2 + 7 = 0$

S. S. = $\{x_1, x_2, \ldots x_n\}$

⇒ **n = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

4. $3x^2 + mx - 2 = 0$

$\Delta = 24$

⇒ **m = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

5. $x^2 + kx + 54 = 0$

S. S. = $\{x_1, x_2\}$

$x_1, x_2 \in Z$

Buna göre, k kaç farklı değer alır?

If $x_1, x_2 \in Z$ how many different values could "k" take?

A) 2 B) 4 C) 8 D) 10 E) 12

6. $5^{x^2 - 7x + 6} = 1$

⇒ **S. S. = ?**

A) $\{1\}$ B) $\{6\}$ C) $\{1, 6\}$

D) $\{-1, -6\}$ E) $\varnothing$

7. $x^3 + 2x = 3x^2$

⇒ **S. S. = ?**

A) $\{1, 2\}$ B) $\{0, -1\}$ C) $\{0, -1, 2\}$

D) $\{0, 1, 2\}$ E) $\{-1, 1, 2\}$

8. $25^x + 9 \cdot 5^x + 8 = 0$

⇒ **S. S. = ?**

A) $\{5\}$ B) $\{1, 3\}$ C) $\{0, 5\}$

D) $\{2, 3\}$ E) $\varnothing$

9. $x^2 + mx + 4 = 0$

S. S. = $\varnothing$

$m \in Z$

$\Rightarrow$ **min(m) = ?**

A) – 4 B) – 3 C) –2 D) – 1 E) 0

10. $(x^2 + 3x)^2 - 2(x^2 + 3x) - 8 = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{-1, -4\}$ B) $\{-1, 1\}$ C) $\{-2, -1, 1\}$

D) $\{-2, -1, 4\}$ E) $\{-4, -2, -1, 1\}$

11. $(x + 5)^4 - 7(x + 5)^2 - 18 = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{-2\}$ B) $\{-8, -2\}$ C) $\{2\}$

D) $\{2, 8\}$ E) $\varnothing$

12. $\dfrac{x^2 + 4x + 4}{x^2} - \dfrac{4x + 8}{x} + 4 = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{1\}$ B) $\{-1, 1\}$ C) $\{-2, 2\}$

D) $\{2\}$ E) $\{-2, -1, 1, 2\}$

13. $x^3 - \dfrac{4}{x-3} = 64 + \dfrac{4}{3-x}$

$\Rightarrow$ **x = ?**

A) 4 B) 3 C) 1 D) – 3 E) –4

14. a, b, $c \in Z$

$ax^2 + bx + c = 0$

S. S. = $\{x_1, x_2\}$

$x_2 = \sqrt{5} - 2$

$\Rightarrow \dfrac{x_1 \cdot x_2}{x_1 + x_2} = ?$

A) $\dfrac{\sqrt{10}}{5}$ B) $\dfrac{\sqrt{5}}{10}$ C) $\dfrac{1}{4}$

D) $2 - \sqrt{5}$ E) $1 + \sqrt{5}$

15. $x^2 + \dfrac{1}{x^2} + 3x + \dfrac{3}{x} - 8 = 0$

S. S. = $\{x_1, x_2, x_3\}$

$\Rightarrow$ **$x_1 + x_2 + x_3$ = ?**

A) – 5 B) – 4 C) – 3 D) 2 E) 1

16. $x^2 - 7x + 9 = 0$

S. S. = $\{x_1, x_2\}$

$x_2 > x_1$

$\Rightarrow \sqrt{x_1} - \sqrt{x_2} = ?$

A) 3 B) $\sqrt{7}$ C) $-\sqrt{7}$ D) 1 E) – 1

1-B 2-A 3-A 4-E 5-C 6-C 7-D 8-E 9-B 10-E 11-B 12-D 13-A 14-C 15-B 16-E

TEST 6

1. $\frac{(x-a)\,.\,(x-b)}{(x-a)+(x-b)} = x$

S. S. = $\{x_1, x_2\}$

$\Rightarrow$ $x_1 + x_2 = ?$

A) 0 B) 1 C) $\sqrt{a\,.\,b}$ D) a^2 E) b^2

2. $2x^2 - 8x + a^2 + b^2 = 0$

S. S. = $\{a, b\}$

$\Rightarrow$ $\Delta = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

3. $x^2 + a\,.\,|x| + 6 = 0$

S. S. = $\{x_1, x_2, x_3, x_4\}$

$x_1^2 + x_2^2 + x_3^2 + x_4^2 = 26$

$\Rightarrow$ $a = ?$

A) -5 B) -1 C) 0 D) 1 E) 5

4. $x^2 - 13x + 6n = 0$

S. S. = $\{x_1, x_2\}$

$x_1, x_2 \in Z^+$

$x_1 \,.\, x_2$ çarpımının <u>en büyük</u> değerini alması için n kaç olmalıdır?

for taking the biggest product of $x_1 \,.\, x_2$ what should be the value of n?

A) 4 B) 5 C) 6 D) 7 E) 8

5. $x^2 - (m-2)x + 8 = 0$

S. S. = $\{x_1, x_2\}$

$x_1^2 = x_2$

$\Rightarrow$ $m = ?$

A) 3 B) 7 C) 8 D) 9 E) 10

6. $x^2 + 2x + m + 1 = 0$

S. S. = $\{x_1, x_2\}$

$m^2 + 5m - 8 = x_1 \,.\, x_2$

$\Rightarrow$ $\Sigma m = ?$

A) -5 B) -4 C) -3 D) -2 E) 0

7. $(a-1)x^2 - 6x + 3 = 0$

S. S. = $\{x_1\}$

$\Rightarrow$ $\Sigma a = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

8. $x^2 + (a-5)x - 3a - 1 = 0$

denkleminin simetrik iki kökü olduğuna göre, a kaçtır?

If the equation has symmetrical two roots, then what is the value of a?

A) 5 B) 3 C) 1 D) -3 E) -5

9. $x^2 - 5x + 1 = 0$

S. S. $= \{x_1, x_2\}$

$\Rightarrow \dfrac{1}{\sqrt{x_1}} + \dfrac{1}{\sqrt{x_2}} = ?$

A) $-\sqrt{7}$ B) $-\sqrt{6}$ C) $\sqrt{5}$ D) $\sqrt{6}$ E) $\sqrt{7}$

10. $ax^2 + bx + c = 0$

S. S. $= \{-3, 5\}$

$\Rightarrow a + b + c = ?$

A) -12 B) -14 C) -16 D) 2 E) 5

11. $(3x-5) \cdot (x-7) \cdot (3x-1) \cdot (x+4) = 0$

$\Rightarrow \Sigma x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

12. $x^2 - 5x + 2 = 0$

S. S. $= \{m, x_2\}$

$\Rightarrow \dfrac{(m-4) \cdot (m-1)}{(m-3) \cdot (m-2)} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{2}{3}$ D) $\frac{3}{2}$ E) 2

13. $x^2 + x - 12 = y$

$x - y = 3$

$\Rightarrow \Sigma x = ?$

A) 3 B) 0 C) -1 D) -2 E) -3

14. $x^2 + 2(a+2)x + 5a = 0$

S. S. $= \{x_1, x_2\}$

$|x_1| = |x_2|$

$\Rightarrow \Sigma a = ?$

A) -2 B) -1 C) 0 D) 1 E) 2

15. $x^2 - 6x + 3 = 0$

S. S. $= \{x_1, x_2\}$

$\Rightarrow x_1^2 + 6x_2 + 5 = ?$

A) 25 B) 30 C) 35 D) 36 E) 38

16. $x^2 - ax + 3 = 0$ S. S. $= \{x_1, x_2\}$

$x^2 - 8x + b - 5 = 0$ S. S. $= \{x_1 + 2, x_2 + 2\}$

$\Rightarrow a + b = ?$

A) 25 B) 24 C) 23 D) -24 E) -25

1-A 2-E 3-A 4-D 5-C 6-B 7-E 8-A 9-E 10-C 11-D 12-A 13-B 14-A 15-E 16-B

ÜNİTE 3

Unit 3

II. Dereceden Eşitsizlikler / Quadratic Inequations

1. I. $(x-2).(x+1) < 0$ S.S. = $(-1, 2)$

II. $x^2 + x + 1 < 0$ S.S. = $\varnothing$

III. $x^2 + 3x + 7 > 0$ S.S. = R

ifadelerinden hangileri doğrudur?

Which of the expressions above are true?

A) Yalnız I B) I ve II C) I ve III

D) II ve III E) I, II ve III

2. $9^x - 10 . 3^x + 9 \leq 0$

$\Rightarrow$ **S . S = ?**

A) $[0, 2]$ B) $[1, 2]$ C) $[0, 1]$

D) $(0, 2)$ E) $(1, 2)$

3. $\dfrac{(4-x).(x+5)}{(x-1).(x-2)} \geq 0$

$\Rightarrow$ **S.S = ?**

A) $(1, 2)$ B) $[-5, 1) \cup (2, 4]$ C) $\varnothing$

D) $[-1, 5]$ E) $[-5, 1] \cup [2, 4]$

4. $x \in Z$

$6x - 8 \geq x^2$

$\Rightarrow$ Σx **= ?**

A) 2 B) 4 C) 9 D) 14 E) 16

5. $\dfrac{x^2 - 6x + 5}{(x-3)^2} < 0$

$\Rightarrow$ **S.S = ?**

A) $(1, 5)$ B) $(3, 5)$ C) $(1, 5) \setminus \{3\}$

D) $(1, 3)$ E) $\varnothing$

6. $\dfrac{3^{-x} . |x-3|}{x^2 - 4x + 3} \leq 0$

$\Rightarrow$ **S.S = ?**

A) $(1, 3)$ B) $(1, 3]$ C) $[1, 3)$

D) $[1, 3]$ E) IR

7. $x \in Z$

$\dfrac{7^x . |x-8|}{x^2 - 6x + 5} \leq 0$

$\Rightarrow$ Σx **= ?**

A) 5 B) 7 C) 9 D) 17 E) 18

8. $\dfrac{x^2 - 8x + 7}{x^2 - 4x + 3} < 0$

$\Rightarrow$ **S.S. = ?**

A) $(3, 7)$ B) $[3, 7)$ C) $[1, 7]$

D) $[2, 5]$ E) $(1, 7)$

9. $x \in N$

$(x+1) \cdot (x-2) \leq (x-3) \cdot (x-5)$

S. S. $= \{x_1, x_2, \ldots x_n\}$

$\Rightarrow$ **n = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $x + \frac{9}{x} < -1$

$\Rightarrow$ **S. S. = ?**

A) $\varnothing$ B) R C) R^+ D) R^- E) $R \setminus \{0\}$

11. $x \in Z^-$

$(x-2)^7 \cdot (x^2-23)^{11} \geq 0$

S.S. $= \{x_1, x_2, x_3 \ldots x_n\}$

$\Rightarrow$ **n = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $x \in Z$

$x^4 \leq 36$

$\Rightarrow \prod x = ?$

A) 6! B) 36 C) 24 D) 6 E) 0

13. $x \in Z$

$\frac{x^{33} \cdot (x-5)^{40}}{x^3 - 9x} \leq 0$

S.S. $= \{x_1, x_2, \ldots x_n\}$

$\Rightarrow$ **n = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

14. $x \in Z$

$\frac{8}{x} > \frac{x}{5}$

$\Rightarrow$ **max(x) = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

15. $\frac{3x}{x-5} \leq \frac{6}{5-x}$

$\Rightarrow$ **S.S. = ?**

A) $[-5, 2)$ B) $[-2, 5)$ C) $[-5, 6)$
D) $[-2, 6)$ E) $[-5, -2)$

16. $\frac{5}{x^2} < \frac{5}{4x-4}$

$\Rightarrow$ **S.S. = ?**

A) $(1, \infty) \setminus \{2\}$ B) $\{2, 5\}$ C) $(2, 5)$
D) $[2, 5]$ E) $R \setminus \{2\}$

1-E 2-B 3-B 4-C 5-C 6-A 7-D 8-A 9-C 10-D 11-D 12-E 13-A 14-C 15-B 16-A

1. $m \in Z^+$

$x^2 + (5 - m)x + 7m = 0$

S. S. = $\{x_1, x_2\}$

$\frac{x_1 + x_2}{x_1 \cdot x_2} > 0$

⇒ **min(m) = ?**

A) 4 B) 5 C) 6 D) 7 E) – 1

2. $x^2 + 4x + 3 > 1 - k$

S. S. = R

k hangi aralıkta değer alır?
Which interval could "k" have values?

A) $(2, \infty)$ B) $[2, \infty)$ C) $(-2, \infty)$
D) $[-2, \infty)$ E) $(-\infty, 2)$

3. $x \in Z$

$\sqrt{x^2 + 3x - 4} - 6 < 0$

⇒ **Σx = ?**

A) – 9 B) – 12 C) – 14 D) – 16 E) – 18

4. $\frac{\sqrt{x^2 + 7}}{|x + 3| - 5} < 0$

⇒ **S.S. = ?**

A) $(-2, 8)$ B) $(-8, 7)$ C) $(-7, 8)$
D) $(1, 2)$ E) $(-8, 2)$

5. $-x^2 + 8x > a + 3$

S. S. = Ø

a hangi aralıkta değer alır?
Which interval could "a" have values?

A) $(-\infty, 13)$ B) $(13, \infty)$ C) $(-13, 13)$
D) $(1, \infty)$ E) Ø

6. $\frac{|x - 1| - 2}{|x - 3|} \leq 0$

⇒ **S.S. = ?**

A) $(-1, 3]$ B) $[-1, 3]$ C) $[-1, 3)$
D) $(-3, -1)$ E) $[-3, -1]$

7. $\frac{(x^2 - x + 2) \cdot 3^x}{|2x - 10|} > 0$

⇒ **S.S. = ?**

A) (1, 2) B) (1, 5) C) (2, 5)
D) $R \setminus \{5\}$ E) $R \setminus \{2\}$

8. $x \in Z$

$5 - 2x \leq x^2 + 2x \leq 15$

⇒ **Σx = ?**

A) 7 B) 6 C) 5 D) 3 E) 1

9. $\left(\frac{3}{5}\right)^{x^2-4x} > \left(\frac{3}{5}\right)^5$

⇒ **S. S. = ?**

A) (1, 5) B) (– 1, 5) C) (– 1, 1)
D) (– 5, 5) E) R

10. $x^2 - 4x < 0$

$x^2 - 25 \leq 0$

⇒ **S.S. = ?**

A) $[0, 4)$ B) $[0, 4]$ C) $(0, 4)$
D) $(0, 4]$ E) $\varnothing$

11. $\frac{1}{x} < \frac{x}{9} < \frac{3}{x^2}$

⇒ **S.S. = ?**

A) (– 3, 0) B) (– 2, 0) C) (– 1, 0)
D) (– 1, 1) E) $(-\infty, \infty)$

12. $(m - 2)x^2 + 3mx + m + 4 = 0$

S. S. = $\{x_1, x_2\}$

$x_1 < 0 < x_2$

⇒ **? < m < ?**

A) – 2 < m < 4 B) – 4 < m < 2
C) – 2 < m < 3 D) – 3 < m < 2
E) – 3 < m < 4

13. $\sqrt{x+3} \cdot (4x - 20) \leq 0$

⇒ Πx = ?

A) – 60 B) – 20 C) 0 D) 20 E) 60

14. $\frac{1}{x-1} \geq 0$

$\frac{x-7}{4} \leq 0$

⇒ **S.S. = ?**

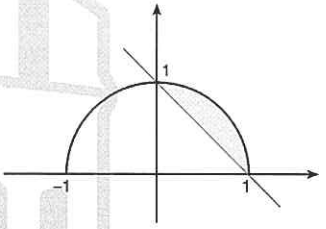
A) 

B) 

C) 

D) 

E) 

15. 

Aşağıdaki eşitsizlik sistemlerinden hangisi taralı alanı verir?

Which of the following inequality gives the shaded area?

A) $y \geq 1 - x$
$y \geq \sqrt{-x^2 + 1}$

B) $y \geq 1 - x$
$y \leq \sqrt{-x^2 + 1}$

C) $y \leq 1 - x$
$y \leq \sqrt{x^2 - 1}$

D) $y \geq 1 - x$
$y \geq \sqrt{x^2 - 1}$

E) $y \geq x + 1$
$y \leq \sqrt{-x^2 + 1}$

1-C 2-A 3-B 4-E 5-B 6-C 7-D 8-B 9-B 10-C 11-A 12-B 13-C 14-D 15-B

TEST 3

1. $\forall x \in R$

$(m-2)x^2 - 2x + 6 > 5$

$\Rightarrow$ **? < m < ?**

A) $m < 3$ B) $m \leq 3$ C) $3 < m$

D) $3 \leq m$ E) $1 < m < 3$

2. $\dfrac{|x-7| \,.\, (x^2-4)}{x^2-3x-4} < 0$

$\Rightarrow$ **S.S. = ?**

A) $(-2, 0)$ B) $(0, 2)$ C) $(0, 1)$

D) $(-2, 4)$ E) $(-2, -1) \cup (2, 4)$

3. $f: R \to R$

$f(x) = (x^2 + x - 2) \,.\, \sqrt{x-2}$

$f(x) \leq 0$

$\Rightarrow$ **S.S. = ?**

A) $[-2, 1]$ B) $[-2, 1] \cup \{2\}$ C) $\{2\}$

D) $[-2, 2]$ E) $\varnothing$

4. $x \in Z$

$12 \leq x^2 - 6x - 4 < 36$

$\Rightarrow$ Σx **= ?**

A) 8 B) 10 C) 12 D) 13 E) 18

5. $x^4 - 12x^2 + 4a - 8 = 0$

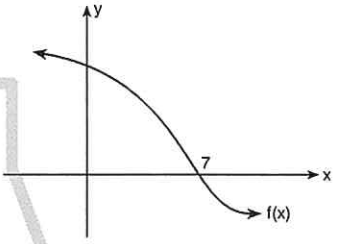
S. S. $= \{x_1, x_2, x_3, x_4\}$

$\Rightarrow$ **? < a < ?**

A) $2 < a < 11$ B) $0 < a < 2$ C) $-1 < a < 2$

D) $-2 < a < 0$ E) $2 < a$

6. $x \in Z$



$(x-4) \,.\, f(x) \geq 0$

S. S. $= \{x_1, x_2, \ldots x_n\}$

$\Rightarrow$ **n = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

7. $x \in Z^-$

$|x| \leq |x + 10|$

$\Rightarrow$ Σx **= ?**

A) -8 B) -10 C) -12 D) -15 E) -30

8. $x \in Z$

$$\frac{x-6}{a-x} > 0$$

S. S. $= \{x_1, x_2, x_3\}$

$\Rightarrow \Sigma a = ?$

A) 10 B) 11 C) 12 D) 13 E) 14

9. $x^2 - xz - xy + yz < 0$

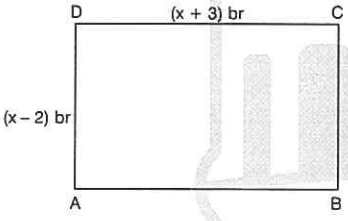
olduğuna göre, aşağıdaki sıralamalardan hangisi doğru olabilir?

according to the information above which of the rankings bellow is true?

A) $z < x < y$ B) $y < z < x$ C) $x < z < y$

D) $z < y < x$ E) $x < y < z$

10.



$|AD| = (x - 2)$ br, $|DC| = (x + 3)$ br

ABCD dikdörtgen (rectangle)

$A(ABCD) < 36$ br^2

$x \in Z \Rightarrow \Sigma x = ?$

A) 15 B) 14 C) 12 D) 9 E) 5

11. $a < 0 < b$

$(bx - a) \cdot (b - x)^5 < 0$

$\Rightarrow$ **S. S. = ?**

A) $\left(\frac{a}{b}, b\right)$ B) $R \setminus \left[\frac{a}{b}, b\right]$ C) $\left(\frac{b}{a}, a\right)$

D) (a, b) E) $\varnothing$

12. $x^2 - mx - x + m = 0$

Aşağıdakilerden hangisi <u>kesinlikle</u> doğrudur?

Which of the following is absolutely true?

A) $0 < x_1 < x_2$ B) $x_1 < 0 < x_2$ C) $x_1 + x_2 < 0$

D) $x_1 \cdot x_2 > 0$ E) $\Delta \geq 0$

13. $x \in Z$

$$\frac{x-a}{x-2a-1} \leq 0$$

S. S. $= \{x_1, x_2, x_3, x_4, x_5\}$

$\Rightarrow$ **a = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

14. $x \in Z^+$

$$|x + 2| \leq \sqrt{2x + 7}$$

$\Rightarrow \Sigma x = ?$

A) – 2 B) – 5 C) 5 D) 2 E) 1

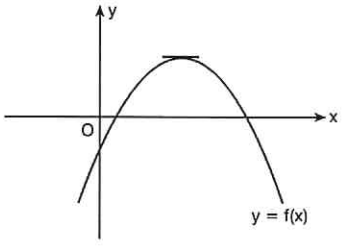
1-C 2-E 3-C 4-C 5-A 6-C 7-D 8-C 9-A 10-C 11-B 12-E 13-D 14-B

ÜNİTE 4

Unit 4

Parabol / Parabola

1.



$f(x) = ax^2 + bx + c$

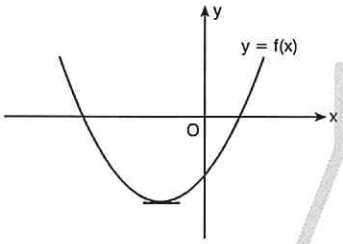
a, b, c nin işareti aşağıdakilerden hangisidir?

Which of the following is the sign of a, b and c?

A) +, +, + B) –, –, – C) –, +, –

D) –, +, + E) +, –, +

2.



$f(x) = (3 - a)x^2 + 2x - 5$

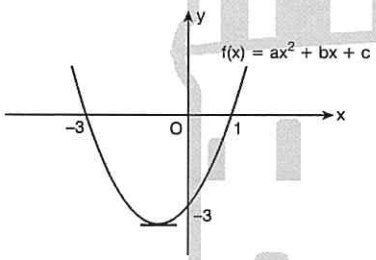
ise a hangi aralıkta değer alır?

Which interval will "a" be located in?

A) $(-\infty, 3)$ B) $(3, \infty)$ C) $(-\infty, -3)$

D) $(-3, \infty)$ E) $(-3, 3)$

3.

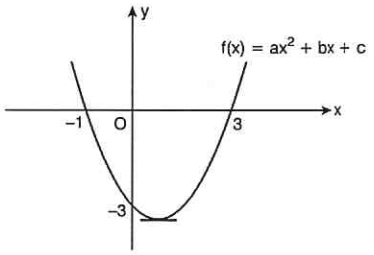


⇒ **f(x) = ?**

A) $x^2 - 2x - 3$ B) $x^2 + 2x - 3$ C) $x^2 + 2x + 3$

D) $x^2 + 5x - 3$ E) $x^2 - 5x - 3$

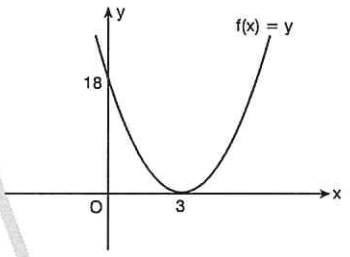
4.



⇒ $\frac{b \cdot c}{a} = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

5.

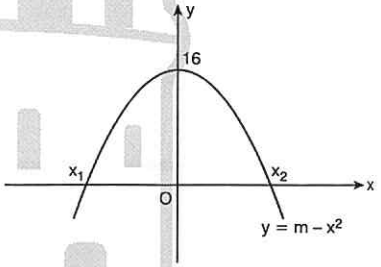


⇒ **f(x) = ?**

A) $2(x - 3)^2 + 18$ B) $2(x + 3)^2$ C) $2(x - 3)^2$

D) $2(x - 3)^2 - 1$ E) $(x - 3)^2 + 18$

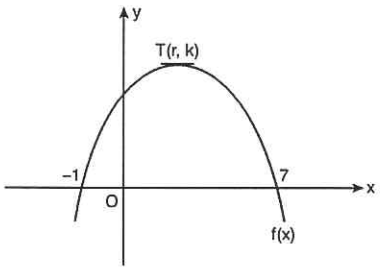
6.



⇒ $x_1 \cdot x_2 = ?$

A) – 16 B) – 4 C) – 1 D) 4 E) 16

7.



$f(x) = ax^2 + bx + c$

⇒ **r = ?**

A) 1 B) 2 C) 3 D) 4 E) 7

8. $A = x^2 + 4x - 1$

$B = -x^2 + 2x$

⇒ $\dfrac{\textbf{min(A)}}{\textbf{max(B)}} = ?$

A) $\frac{1}{5}$ B) $-\frac{1}{5}$ C) 5 D) – 4 E) – 5

9. $f(x) = -x^2 + 4x + n$

$\max[f(x)] = 12$

⇒ **n = ?**

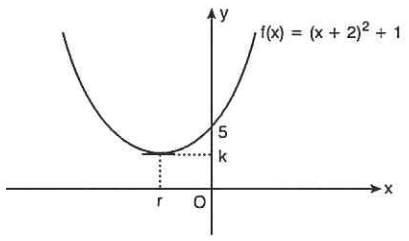
A) 4 B) 5 C) 6 D) 7 E) 8

10. $f(x) = 6 \cdot (2x^2 - 4x + 3)^{-1}$

⇒ **max[f(x)] = ?**

A) 24 B) 18 C) 12 D) 6 E) 3

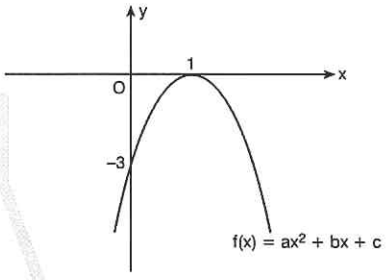
11.



⇒ **min[f(x)] = ?**

A) – 2 B) 1 C) 2 D) 3 E) 4

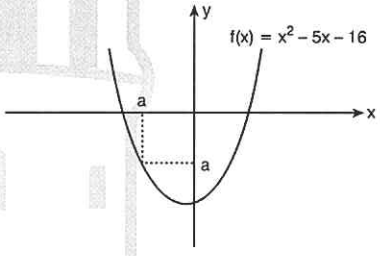
12.



⇒ **$(fofof)_{(1)}$ = ?**

A) 49 B) 48 C) – 48 D) – 49 E) 12

13.

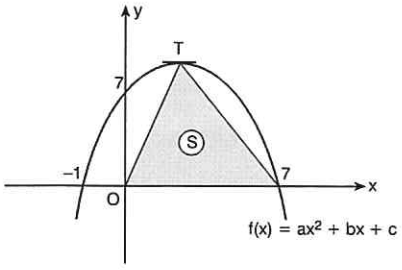


⇒ **a = ?**

A) – 4 B) – 3 C) – 2 D) – 1 E) 8

1-C 2-A 3-B 4-D 5-C 6-A 7-C 8-E 9-E 10-D 11-B 12-C 13-C

1.

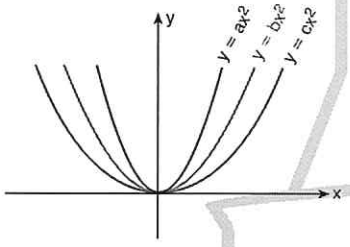


T(r, k)

⇒ **S = ?**

A) 56 B) 48 C) 24 D) 20 E) 18

2.



⇒ **? < ? < ?**

A) a < b < c B) c < b < a C) a < c < b

D) b < c < a E) c < a < b

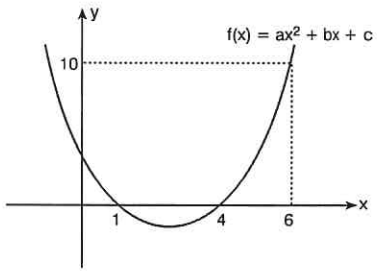
3. $f(x) = 3(x - 20)^2 + k$

$f(8) = 63$

⇒ **f(32) = ?**

A) 8 B) 20 C) 63 D) 68 E) 70

4.



⇒ **a – b + c = ?**

A) 20 B) 15 C) 10 D) 5 E) 1

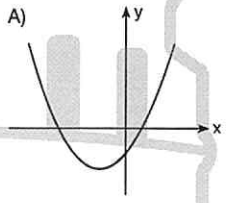
5. $a < 0 < b < c$

$f(x) = ax^2 + bx + c$

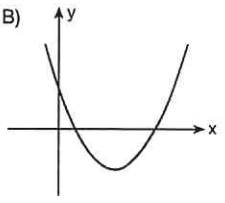
f(x) in grafiği aşağıdakilerden hangisi olabilir?

Which one of the following can be the graph of f(x)?

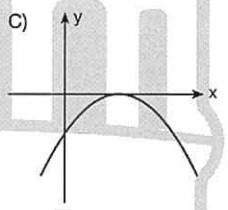
A)



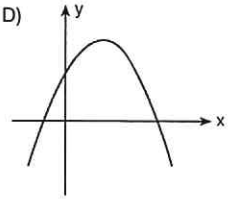
B)



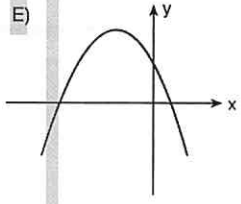
C)



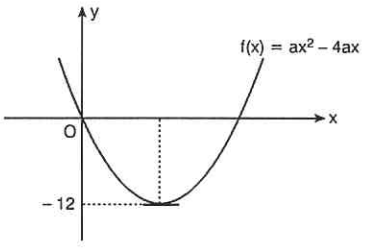
D)



E)



6.



⇒ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

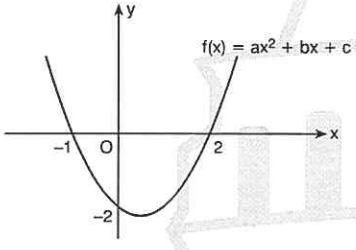
7. f: $[0, 3] \to R$

$y = f(x) = 4x^2 - 16x + 5$

⇒ **min(y) + max(y) = ?**

A) – 18 B) – 12 C) – 7 D) – 6 E) – 5

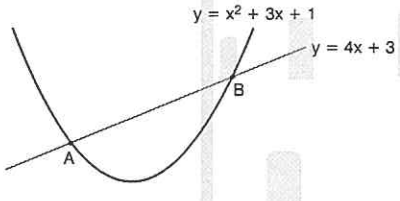
8.



⇒ **min[f(x)] = ?**

A) $\frac{1}{2}$ B) $\frac{9}{4}$ C) $-\frac{9}{2}$ D) $-\frac{9}{4}$ E) 1

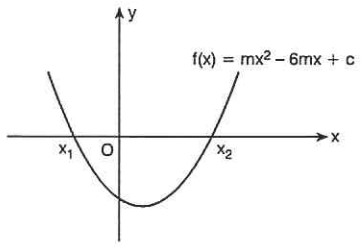
9.



⇒ **|AB| = ?**

A) 17 B) $\sqrt{17}$ C) $\sqrt{3}$ D) $17\sqrt{3}$ E) $3\sqrt{17}$

10.

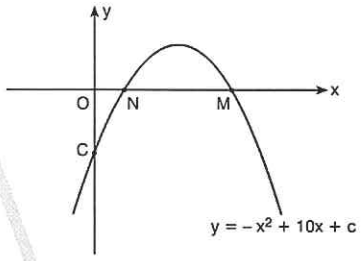


$|x_1 - x_2| = 9$

⇒ **$x_1 \cdot x_2$ = ?**

A) $-\frac{45}{4}$ B) $-\frac{3}{2}$ C) $\frac{5}{2}$ D) $\frac{17}{4}$ E) 5

11.

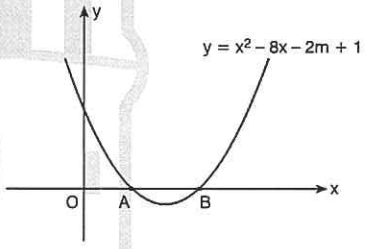


$|OM| = 4|ON|$

⇒ **c = ?**

A) – 16 B) – 12 C) – 8 D) – 4 E) – 3

12.



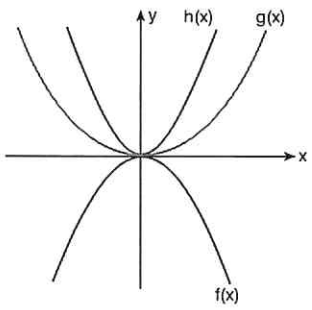
$|AB| = 6$

⇒ **m = ?**

A) – 1 B) – 2 C) – 3 D) – 4 E) – 5

1-A 2-B 3-C 4-C 5-D 6-C 7-D 8-D 9-E 10-A 11-A 12-C

1.

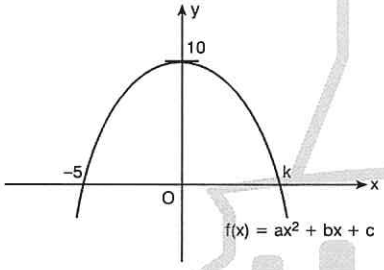


$f(x) = mx^2$, $g(x) = nx^2$, $h(x) = kx^2$

$\Rightarrow$ $|m - n| + |n - k| - |k - m| = ?$

A) 2k B) 2m C) 2n D) 2k – 2m E) 0

2.



$\Rightarrow$ $a + b + c + k = ?$

A) $\frac{123}{5}$ B) $\frac{73}{5}$ C) $\frac{48}{5}$ D) $\frac{1}{5}$ E) 1

3. $x = t + 2$

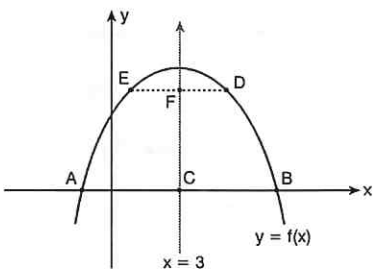
$y = t^2 - 2t$

Parametrik denklemi verilen parabol aşağıdakilerden hangisidir?
Which of the following is parabola which gives parametric equation?

A) $x^2 + 6x + 8$ B) $x^2 - 6x + 8$ C) $-x^2 + 3x + 4$

D) $-x^2 - 3x + 4$ E) $x^2 + 3x + 8$

4.



$y = (m - 7)x^2 + mx + 3$

$|AC| = |BC|$, $|EF| = |FD|$

$\Rightarrow$ $m = ?$

A) 6 B) 5 C) 3 D) 2 E) 1

5. $f: [1, 4] \to R$

$f(x) = x^2 - 6x + 4$

$\max[f(x)] = m$

$\Rightarrow$ $f(m) = ?$

A) 59 B) 44 C) 33 D) 11 E) – 4

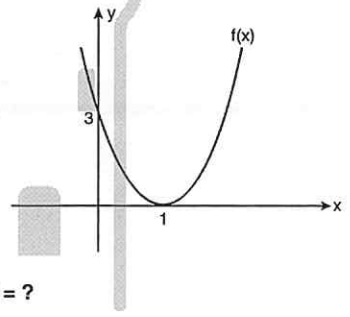
6. $f(x) = -x^2 + 6x + m - 2$

$\max[f(x)] = 12$

$\Rightarrow$ $m = ?$

A) 2 B) 4 C) 5 D) 6 E) 8

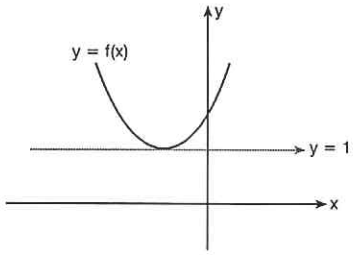
7.



$\Rightarrow$ $f(3) = ?$

A) 3 B) 4 C) 7 D) 10 E) 12

8.

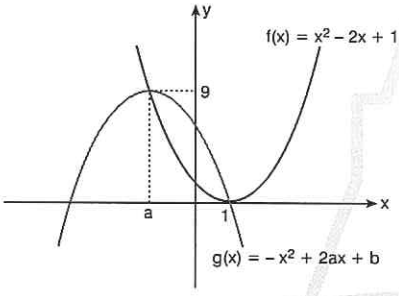


$y = x^2 - 2(a + 1)x + a^2 - 1$

⇒ **2a = ?**

A) $-\frac{3}{2}$ B) $-\frac{3}{4}$ C) -3 D) $\frac{3}{2}$ E) $\frac{3}{4}$

9.

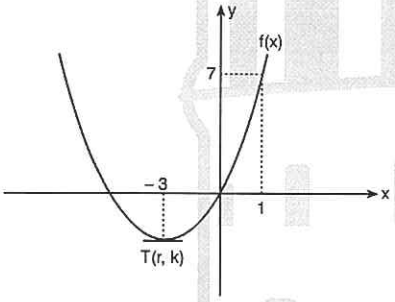


$g(x) = -x^2 + 2ax + b$

⇒ **g(0) = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

10.

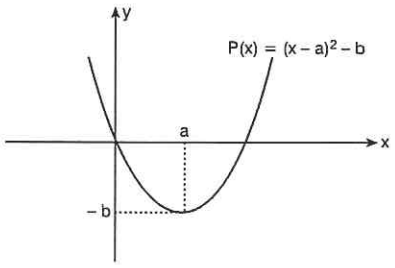


$f(a) = 7 \quad a \neq 1$

⇒ **a = ?**

A) – 9 B) – 8 C) – 7 D) – 6 E) – 5

11.



P(x + a) + b nin tepe noktası (Peak) T_1

P(x + a) – b nin tepe noktası (Peak) T_2

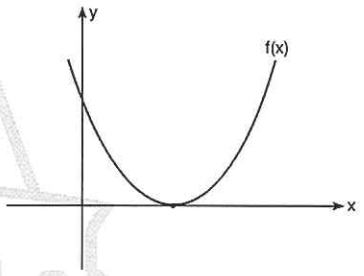
P(x – a) – b nin tepe noktası (Peak) T_3

$A(\widehat{T_1T_2T_3}) = 16\ br^2$

⇒ **a + b = ?**

A) 18 B) 14 C) 10 D) 6 E) 4

12.

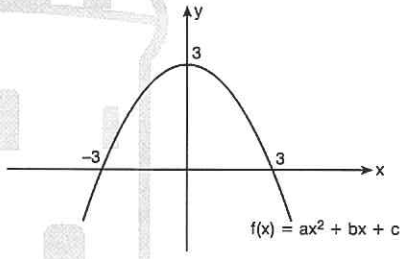


$f(x) = ax^2 - 6x + a$

⇒ **f(a) = ?**

A) 4 B) 6 C) 8 D) 10 E) 12

13.



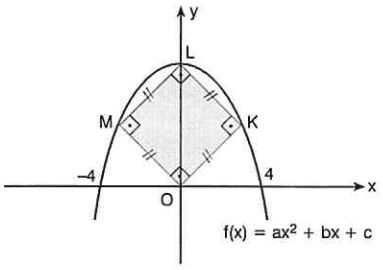
⇒ **f(5) = ?**

A) $-\frac{25}{3}$ B) $-\frac{16}{3}$ C) $-\frac{17}{3}$ D) – 6 E) $-\frac{1}{3}$

1-E 2-B 3-B 4-A 5-D 6-C 7-E 8-C 9-A 10-C 11-D 12-E 13-B

TEST 4

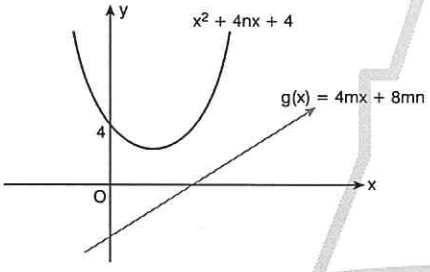
1.



⇒ **A(OKLM) = ?**

A) 10 B) 16 C) 25 D) 36 E) 49

2.



m ve n için aşağıdakilerden hangisi doğrudur?

Which of the followings expression of m and n is correct?

A) $m^2 + n^2 > 1$ B) $m^2 - n^2 > 1$ C) $m^2 + n^2 < 1$

D) $m^2 - n^2 < 1$ E) $m^2 > n^2$

3. $f(x) = x^2 - ax + 3$

Parabolü x = 5 doğrusuna göre simetriktir.

Buna göre, a = ?

Parabola is symmetrical according to the line x = 5

⇒ **a = ?**

A) 10 B) 5 C) 1 D) – 5 E) – 10

4. $f(x) = x^2 + 4x + 5$

$g(x) = ax^2 + bx + c$

f(x) ve g(x), y = 3 doğrusuna göre simetriktir.

Buna göre, g(x) = ?

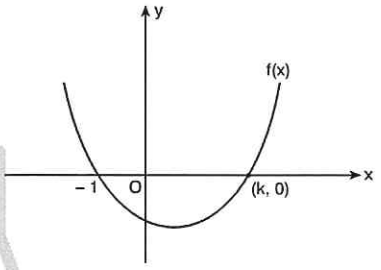
f(x) and g(x) is symmetrical according to the line y = 3

⇒ g(x) = ?

A) $-x^2 + 2x + 4$ B) $x^2 - 2x + 4$ C) $-x^2 - 4x + 1$

D) $-x^2 + 4x + 1$ E) $x^2 - 4x - 1$

5.

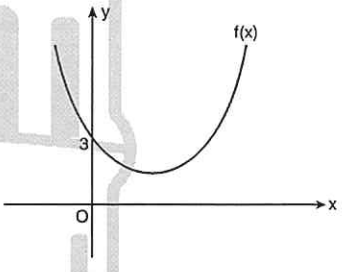


$f(x) = nx^2 - 6x - 7$

⇒ **k = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

6.



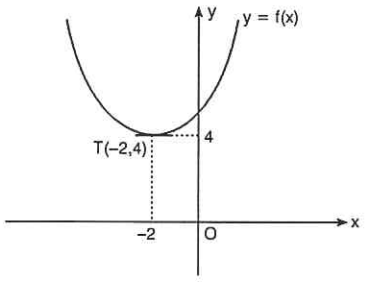
$m \in Z$

$f(x) = mx^2 - 5x + 3$

⇒ **min(m) = ?**

A) – 7 B) – 5 C) 2 D) 3 E) 4

7.

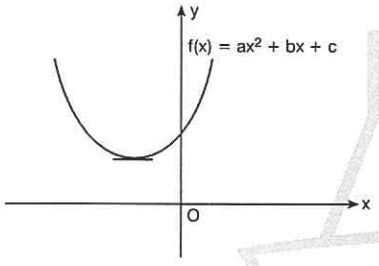


$f(x) = x^2 - ax + 5 - b$

⇒ **a . b = ?**

A) 10 B) 12 C) 14 D) 16 E) 18

8.



I. $b^2 - 4ac < 0$

II. $a \cdot c > 0$

III. $b \cdot c < 0$

ifadelerinden hangileri doğrudur?

Which of the expressions above are true?

A) Yalnız II B) I ve II C) I ve III

D) II ve III E) I, II ve III

9. $f(x) = x^2 - (m - 3)x - 8 + m$

$\min[f(x)] = -4$

⇒ **m = ?**

A) – 6 B) – 5 C) 4 D) 5 E) 6

10. $m, n \in R$

$A = m^2 + 6m + 1$

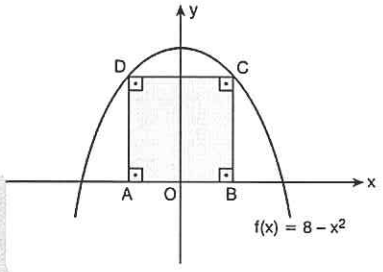
$B = -n^2 + 8n + 4$

A – B aşağıdakilerden hangisi olamaz?

Which one of the following can't be A – B?

A) – 29 B) – 28 C) – 27 D) – 26 E) – 25

11.



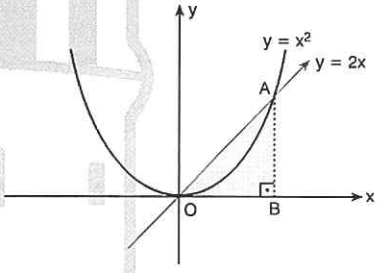
$|AB| = |AD|$

ABCD kare (square)

⇒ **A(ABCD) = ?**

A) 8 B) 16 C) 20 D) 25 E) 36

12.

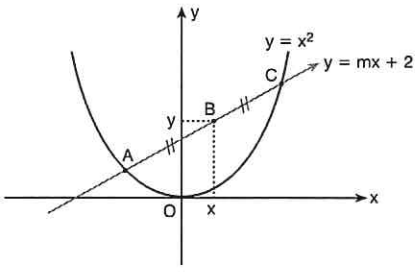


⇒ **A(AOB) = ?**

A) 2 B) 4 C) 8 D) 10 E) 16

1-B 2-C 3-A 4-C 5-E 6-D 7-B 8-B 9-D 10-A 11-B 12-B

1.



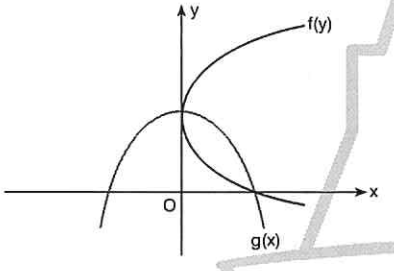
B(x, y) $|AB| = |BC|$

⇒ **y = ?**

A) $\frac{m^2 - 4}{2}$ B) $\frac{m^2 + 4}{2}$ C) 2m

D) $2m^2$ E) $-m^2 - 4$

2.



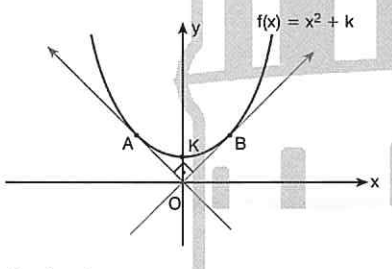
$f(y) = y^2 - my + m$

$g(x) = ax^2 + bx + c$

⇒ **g(8) = ?**

A) – 6 B) – 1 C) 6 D) 5 E) 1

3.



$[AO] \perp [OB]$

⇒ **k = ?**

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

4. $y = x^2 + 6x - 5$

Parabolünün orijine göre simetriği aşağıdakilerden hangisidir?

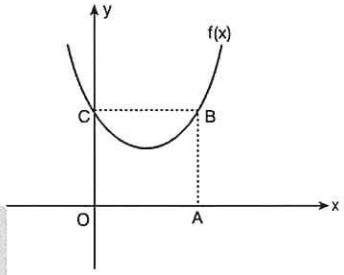
Which one of the following is symmetric of parabola according to the origin?

A) $y = -x^2 - 6x - 5$ B) $y = -x^2 + 6x - 5$

C) $y = -x^2 + 6x + 5$ D) $y = -x^2 - 6x + 5$

E) $y = x^2 + 6x - 5$

5.



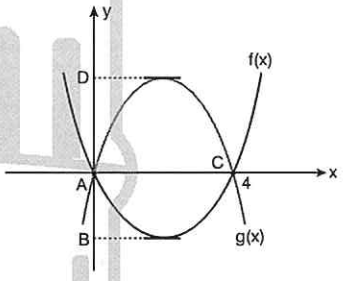
$f(x) = x^2 - (m + 1)x + 2m$

OABC kare (square)

⇒ **|AB| = ?**

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

6.



A(0, 0), C(4, 0), $|BD| = 12$

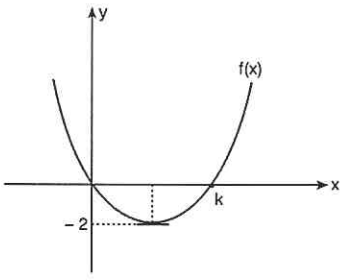
$f(x) = ax^2 + bx$

$g(x) = cx^2 + dx$

⇒ **c – a = ?**

A) 3 B) 2 C) 0 D) – 2 E) – 3

7.

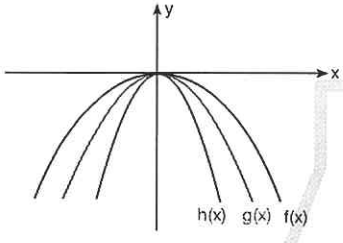


$f(x) = ax^2 + bx + c$

⇒ **f(2k) = ?**

A) 8 B) 16 C) 24 D) 32 E) 40

8.

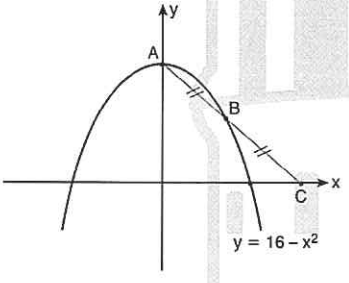


$f(x) = ax^2$, $g(x) = bx^2$, $h(x) = cx^2$

⇒ **? < ? < ?**

A) a > b > c B) c > b > a C) b > a > c
D) b > c > a E) c > a > b

9.



$|AB| = |BC|$ B(m, n)

⇒ **n = ?**

A) 16 B) 12 C) 9 D) 8 E) 7

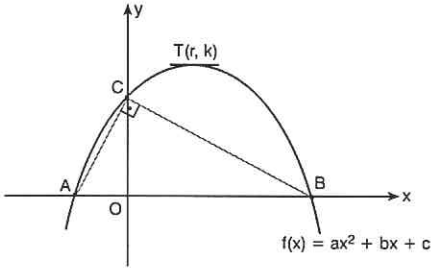
10. f: [– 2, 3] → A

$f(x) = -x^2 + 2x - 6$

⇒ **A = ?**

A) [– 8, – 5] B) [– 9, – 5] C) [– 14, – 5]
D) [– 9, 5] E) [– 5, 14]

11.



[AC] ⊥ [BC]

$4|AO| = |OB|$, $|OC| = 2$ br

⇒ **f(r) = ?**

A) 4 B) 1 C) $\frac{3}{2}$ D) $\frac{5}{8}$ E) $\frac{25}{8}$

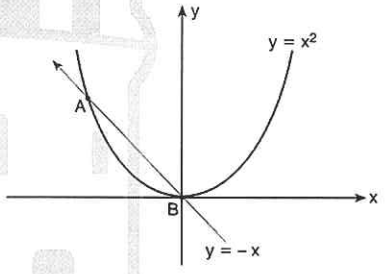
12. x, y ∈ R

$2x + y = 10$

⇒ **min($x^2 + y^2$) = ?**

A) 4 B) 10 C) 15 D) 20 E) 25

13.



⇒ **|AB| = ?**

A) $\sqrt{2}$ B) 1 C) 2 D) 3 E) 4

1-B 2-A 3-C 4-C 5-D 6-E 7-B 8-A 9-D 10-C 11-E 12-D 13-A

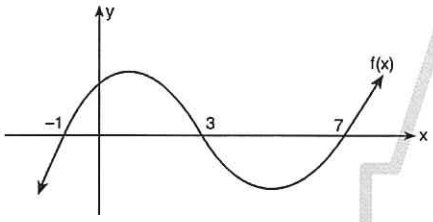
1. $\frac{ax^2 + x}{x^2 - b} > 0$

S. S. = $(-5, 0) \cup (1, 5)$

$\Rightarrow$ **a + b = ?**

A) 22 B) 24 C) 26 D) 28 E) 30

2. $x \in N$



$\frac{x \cdot f(x)}{5 - x} \geq 0$

S. S. = $\{x_1, x_2, x_3, \ldots x_n\}$

$\Rightarrow$ **n = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

3. $x^2 + (1 - m)x + mn - 2 = 0$

S. S. = $\{x_1, x_2\}$

$x_1 < 0 < x_2$

$|x_1| = |x_2|$

$\Rightarrow$ **? < n < ?**

A) 2 < n B) 1 < n < 2 C) n < 2

D) − 2 < n < 1 E) 0 < n < 1

4. $2^{-x^2 + 3x - 3} > \frac{1}{2^{13}}$

$x \in Z \Rightarrow \Sigma x = ?$

A) 9 B) 8 C) 7 D) 6 E) 5

5. $ax^2 + (5 - a)x + 2 = 0$

S. S. = $\{x_1, x_2\}$

$x_1 + x_2 < x_1 \cdot x_2$

$\Rightarrow$ **? < a < ?**

A) a < 3 B) 2 < a < 5 C) 0 < a < 7

D) 0 < a < 3 E) − 2 < a < 5

6. $\frac{\sqrt{4 - x} + 1}{1 - x} < 0$

$\Rightarrow$ **S. S. = ?**

A) $(0, 2]$ B) $[0, 3]$ C) $[1, 4]$

D) $(1, 4]$ E) $(1, 2]$

7. $x^2 + mx + m - 5 = 0$

S. S. = $\{x_1, x_2\}$

$x_1 < 0 < x_2$

$|x_1| > |x_2|$

$\Rightarrow$ **? < m < ?**

A) 1 < m < 6 B) 1 < m C) 0 < m < 5

D) 0 < m E) 5 < m < 6

8. $x \cdot (x+1) < 2 \cdot (x+1)$

$\Rightarrow$ **S. S. = ?**

A) $(-\infty, 2)$ B) $(-1, 2)$ C) $(2, \infty)$

D) $(-1, 1)$ E) $(-2, 2)$

9. $\dfrac{(x^3-1)\cdot(x^4-1)}{x^2-4x+3} \geq 0$

$\Rightarrow$ **S. S. = ?**

A) $(2, \infty)$ B) $(-1, 1)$ C) $[-1, 1) \cup (3, \infty)$

D) $[-1, 3)$ E) $(-\infty, 1)$

10. $x \in N$

$\sqrt{3-|x-5|} < 1$

$\Rightarrow$ Πx **= ?**

A) 16 B) 10 C) 8 D) 6 E) 2

11. $1 + \dfrac{1}{x} + \dfrac{1}{x^2} + \dfrac{1}{x^3} \leq 0$

$\Rightarrow$ **S.S. = ?**

A) $(-3, -1]$ B) $[-1, 5)$ C) $(-1, 1)$

D) $[-1, 0)$ E) $\varnothing$

12. $a \neq 5$

$(a-5)^2 + b^3 \cdot (b-1) = 0$

aşağıdakilerden hangisi <u>kesinlikle</u> doğrudur?

Which of the following is absolutely true?

A) $b < 0$ B) $-1 < b < 0$ C) $0 < b < 1$

D) $1 < b < 5$ E) $-5 < b < 0$

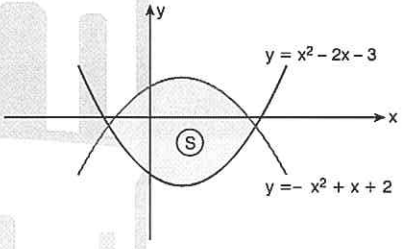
13. $2^{x^2-2x+1} = \dfrac{3}{2}$

S. S. = ?

A) $(0, 2)$ B) $(-\infty, \infty)$ C) $(2, \infty)$

D) $(0, 2) \setminus \{1\}$ E) $(-1, 1)$

14.



(x, y) ∈ S ise (x, y) aşağıdakilerden hangisi olabilir?

Which one of the following can be (x, y)?

A) (0, 3) B) (2, – 1) C) (– 1, 1)

D) (0, – 4) E) (1, 3)

1-B 2-D 3-C 4-A 5-C 6-D 7-C 8-B 9-C 10-A 11-D 12-C 13-D 14-B

1. $P(x) = x^4 + ax^3 + bx^2 + cx + d$

$x_1, x_2, x_3, x_4 \in Z^-$

$P(x_1) = P(x_2) = P(x_3) = P(x_4) = 0$

$a + b + c + d = 209$

$\Rightarrow$ **d = ?**

A) 48 B) 29 C) 24 D) 23 E) 1

2. $P(x - 2) = x^2 - 5x + 11$

P(x) polinomunun x ile bölümünden kalan kaçtır?

What is the remainder of the polynomial P(x) dividing by x?

A) 7 B) 6 C) 5 D) 4 E) 3

3. $P(x) = x^3 - 5x^2 + ax + b$

P(x) polinomunun $(x - 2)^2$ ile bölümünden kalan 0 ise a + b kaçtır?

If the remainder of the polynomial P(x) dividing by $(x - 2)^2$ is 0

$\Rightarrow$ **a + b = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

4. $x^2 - (m + 2)x + 2m - 1 = 0$

S. S. = $\{x_1, x_2\}$

$x_1 + x_2 = -5$

$\Rightarrow$ **$x_1 . x_2$ = ?**

A) – 1 B) – 3 C) – 7 D) – 10 E) – 15

5. $0 < x_1 < x_2$

$x^2 - 6x + 4 = 0$

S. S. = $\{x_1, x_2\}$

$\Rightarrow$ **$x_1 . \sqrt{x_1} + x_2 . \sqrt{x_2}$ = ?**

A) $10\sqrt{10}$ B) $8\sqrt{10}$ C) $6\sqrt{10}$

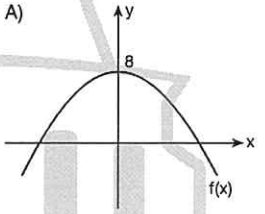
D) $4\sqrt{10}$ E) $\sqrt{10}$

6. $f(x) = (a - 4)x^3 + x^b + a . b$

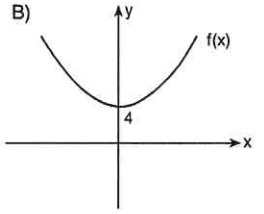
f(x) bir parabol (parabola) ise f(x) in grafiği aşağıdakilerden hangisi olabilir?

Which one of the following can be the graph of f(x)?

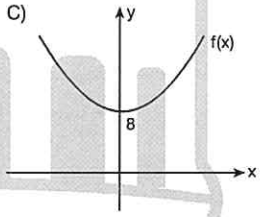
A)



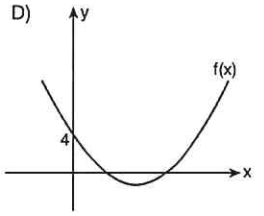
B)



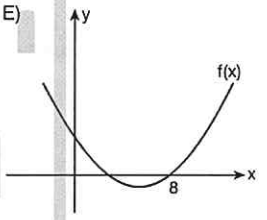
C)



D)



E)



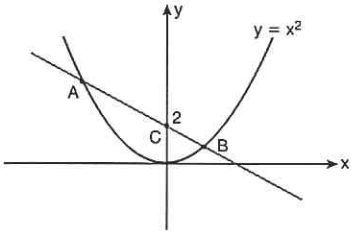
7. $x^2 + px + q = 0$ S. S. $= \{-2, 3\}$

$(x + 1)^2 + p(x + 1) + q = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{-2, 3\}$ B) $\{-3, 2\}$ C) $\{2\}$ D) $\{-3\}$ E) $\varnothing$

8.

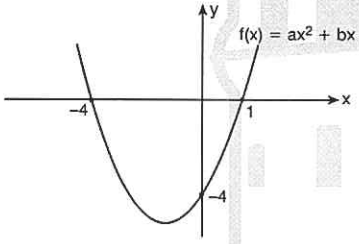


$|AC| = 3|BC|$ $A(n, n^2)$

$\Rightarrow$ **n^2 = ?**

A) 6 B) 7 C) 8 D) 9 E) 12

9.



$\Rightarrow$ **f(3) = ?**

A) 19 B) 18 C) 16 D) 14 E) 12

10. $x^3 - 20x^2 + mx + n = 0$

S. S. $= \{x_1, x_2, x_3\}$

$x_1 : x_2 : x_3 = 2 : 3 : 5$

$\Rightarrow$ **m + n = ?**

A) − 116 B) − 110 C) − 80 D) − 70 E) 0

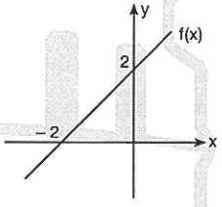
11. $(x - 1)^2 + (x - 2)^2 + \ldots + (x - 5)^2 = 0$

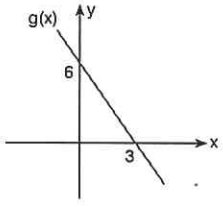
S. S. $= \{x_1, x_2\}$

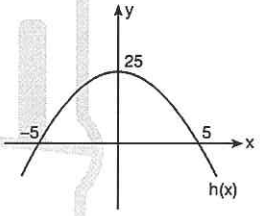
$\Rightarrow \dfrac{x_1 \cdot x_2}{x_1 + x_2} = ?$

A) $\frac{1}{6}$ B) $\frac{5}{6}$ C) $\frac{7}{6}$ D) $\frac{9}{6}$ E) $\frac{11}{6}$

12.







$T(x) = \dfrac{f(x) \cdot h(x)}{g(x)}$

$T(x) \leq 0$

$x \in Z \Rightarrow \Sigma x = ?$

A) 12 B) 7 C) − 2 D) − 5 E) − 10

1-A 2-C 3-A 4-E 5-D 6-C 7-B 8-A 9-D 10-A 11-E 12-D

1. $P(x) = x^4 + Ax^3 + Bx^2 + Cx + D$

$P(x) = P(-x)$

$P(2) = P(3) = 0$

$\Rightarrow$ **P(1) = ?**

A) 12 B) 18 C) 24 D) 30 E) 36

2. P(x) polinom

P(x) polynomial

$(x + 3) \cdot P(x) = x^3 - ax + 27$

$\Rightarrow$ **P(– 3) = ?**

A) 15 B) 18 C) 21 D) 24 E) 27

3. $k \in R$

$P(2x - 3) = x^3 + x^2 - 5x + 6$

$P(x - 1) = (x + 2) \cdot B(x) + k$

$\Rightarrow$ **k = ?**

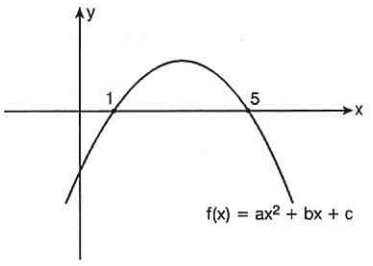
A) 3 B) 4 C) 5 D) 6 E) 7

4. **P(x) polinomunun (x – 1) ile bölümünden kalan 5 ve (x – 3) ile bölümünden kalan 9 olduğuna göre, P(x) polinomunun $x^2 - 4x + 3$ ile bölümünden kalan kaçtır?**

If the remainder of the polynomial P(x) dividing by (x – 1) is 5 and dividing by (x – 3) is 9, then what is the remainder of the polynomial P(x) dividing by $x^2 - 4x + 3$?

A) 2x B) 2x – 1 C) 2x + 1 D) 2x + 3 E) x – 1

5.



$\Rightarrow$ $\frac{f(10)}{f(6)}$ **= ?**

A) 9 B) 10 C) 16 D) 17 E) 18

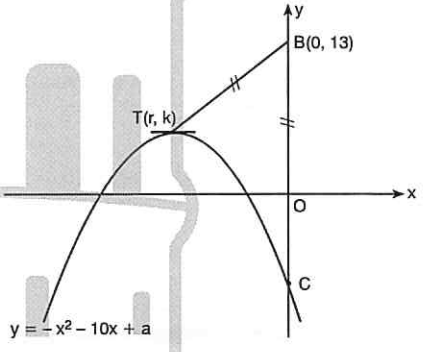
6. $f(x) = x^2 + mx + n$

$f(1) = f(2) = 0$

$\Rightarrow$ **m . n = ?**

A) – 8 B) – 7 C) – 6 D) – 3 E) – 1

7.



$|TB| = |OB|$

$\Rightarrow$ **|OC| = ?**

A) – 24 B) 8 C) 12 D) 24 E) 25

8. $ax^2 + 5x - 1 = 0$

S. S. = $\varnothing$

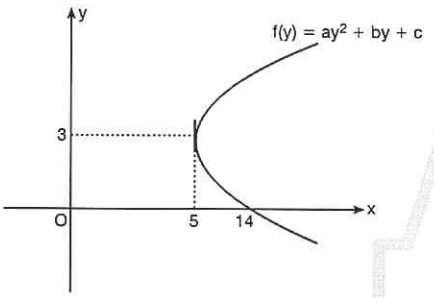
a için aşağıdakilerden hangisi doğrudur?

Which of the followings expression of "a" is correct?

A) $a > -\frac{25}{4}$ B) $a < -\frac{25}{4}$ C) $a \geq -\frac{25}{4}$

D) $a < \frac{25}{4}$ E) $a \leq -\frac{25}{4}$

9.



⇒ **f(y) = ?**

A) $(y + 3)^2 + 5$ B) $(y - 3)^2 + 5$ C) $(y - 5)^2 + 3$

D) $(y - 5)^2 - 3$ E) $2y^2 + 14$

10.

x		-2		2		3	
	+	○	−		−	○	+
	−		−	○	+		+

Yukarıdaki tabloda aşağıdaki eşitsizliklerden hangisi çözülmüştür?

in the given table which of the following inequalities have been solved?

A) $x^2 - x - 6 < 0$
$x^3 - 8 > 0$

B) $x^2 - 9 < 0$
$x^2 - 4 > 0$

C) $x + 2 > 0$
$x - 3 < 0$

D) $x^2 - x - 6 < 0$
$x^3 + 8 > 0$

E) $x^2 - 25 > 0$
$x^2 - x + 3 < 0$

11. $f(x) = x^2 - 4x + 1$

T(r, k) f(x) in tepe noktası (peak)

⇒ **T(r, k) = ?**

A) (1, 1) B) (2, − 3) C) (4, 1)

D) (2, 3) E) (− 2, − 3)

12. $x \in Z$

$(x - n)^2 \cdot (x + 2) \cdot (x - 4) \leq 0$

$\sum x = 12$

⇒ **n = ?**

A) 9 B) 8 C) 7 D) 6 E) 5

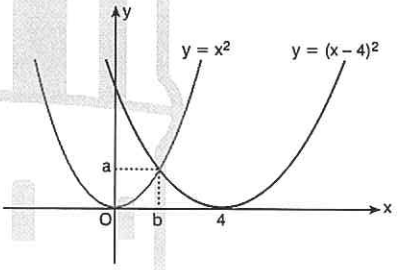
13. $x^3 < x$

⇒ **S. S. = ?**

A) $(-\infty, -1) \cup (0, 1)$ B) (0, 2) C) $(-\infty, 2)$

D) $(2, \infty)$ E) $(-\infty, \infty)$

14.



⇒ **(a, b) = ?**

A) (1, 1) B) (2, 4) C) (4, 2)

D) (1, 2) E) $\left(\frac{1}{2}, \frac{1}{4}\right)$

1-C 2-E 3-D 4-D 5-A 6-C 7-D 8-B 9-B 10-A 11-B 12-E 13-A 14-C

ÜNİTE 5

Unit 5

Trigonometri / Trigonometry

TEST 1

1. $k \in Z$,

$1920° = k \cdot 360° + \alpha$

$\Rightarrow \alpha = ?$

A) 120° B) 160° C) 220° D) 240° E) 280°

2. $k \in Z$,

$-3540° = k \cdot 360° + \alpha$

$\Rightarrow \alpha = ?$

A) 30° B) 40° C) 50° D) 60° E) 80°

3. $k \in Z$,

$\frac{167\pi}{8} = 2k\pi + \alpha$

$\Rightarrow \alpha = ?$

A) $\frac{\pi}{8}$ B) $\frac{7\pi}{8}$ C) $\frac{9\pi}{8}$ D) $\frac{5\pi}{4}$ E) $\frac{7\pi}{4}$

4. $k \in Z$,

$49\pi = k \cdot 2\pi + \alpha$

$\Rightarrow \alpha = ?$

A) 0 B) $\frac{\pi}{4}$ C) π D) $\frac{\pi}{2}$ E) 2π

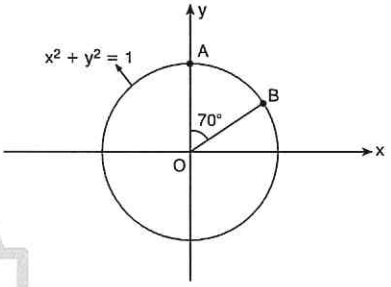
5. $k \in Z$,

$-\frac{49\pi}{3} = k \cdot 2\pi + \alpha$

$\Rightarrow \alpha = ?$

A) $\frac{\pi}{3}$ B) $\frac{2\pi}{3}$ C) π D) $\frac{4\pi}{3}$ E) $\frac{5\pi}{3}$

6.

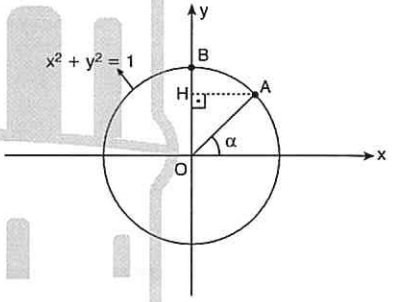


$m(\widehat{AOB}) = 70°$, B(a, b)

$\Rightarrow$ **a = ?**

A) cos70° B) cos20° C) tan70° D) cot70° E) sec20°

7.



$\Rightarrow |\mathbf{BH}| = ?$

A) sinα B) 1 – cosα C) 1 – sinα D) cosα E) cotα

8. **Aşağıdakilerden hangisi yanlıştır?**

Which of the following is not true?

A) $-1 \le \cos\alpha \le 1$ B) $-1 \le \sin\alpha \le 1$

C) $-\infty < \tan\alpha < \infty$ D) $-\infty < \cot\alpha < \infty$

E) $-1 \le \sec\alpha \le 1$

9. $m \in Z$,

$m = 2\sin x + 1$

$\Rightarrow \sum m = ?$

A) 6 B) 5 C) 4 D) 1 E) 0

10. $A = 3\sin x - 4\cos y$

$\Rightarrow$ **max(A) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

11. $B = \sin 3x + \cos 5y$

$\Rightarrow$ **? ≤ B ≤ ?**

A) $-8 \le B \le 8$ B) $-4 \le B \le 4$ C) $-2 \le B \le 2$

D) $-1 \le B \le 1$ E) $0 \le B \le 2$

12. **sinx + cotx . cosx = ?**

A) sinx B) cosx C) secx

D) cosecx E) tanx

13. $\dfrac{1 + \tan x}{1 + \cot x} = ?$

A) sinx B) cosx C) tanx

D) secx E) cotx

14. $A = \dfrac{\cos\alpha}{1 + \sin\alpha}$

$B = \dfrac{1 + \sin\alpha}{\cos\alpha}$

$\Rightarrow$ **A + B = ?**

A) 2 B) $2\cos\alpha$ C) $2\sin\alpha$

D) $2\sec\alpha$ E) $2\operatorname{cosec}\alpha$

15. **$(\cot\alpha - \operatorname{cosec}\alpha) . (1 + \cos\alpha)$ = ?**

A) $-\sin\alpha$ B) $\sin\alpha$ C) $\cos\alpha$

D) $-\cos\alpha$ E) 1

1-A 2-D 3-B 4-C 5-E 6-B 7-C 8-E 9-B 10-D 11-C 12-D 13-C 14-D 15-A

TEST 2

1. $\sin\frac{\pi}{3}\cdot\tan\frac{\pi}{6}+\cos\frac{\pi}{3}\cdot\cot\frac{\pi}{6}=?$

A) $\frac{\sqrt{3}-1}{2}$ B) $\frac{\sqrt{3}+1}{2}$ C) $\sqrt{3}$ D) $\sqrt{3}$ E) 1

2. $\sin^2\frac{\pi}{2}+\cos\pi+\tan 2\pi+\cot\frac{3\pi}{2}=?$

A) 0 B) 1 C) – 1 D) $\sqrt{3}$ E) $\frac{1}{2}$

3. $A=\sin^2\frac{3\pi}{10}+\sin^2\frac{\pi}{5}$

$B=\cot\frac{5\pi}{14}\cdot\cot\frac{\pi}{7}$

$\Rightarrow$ **A + B = ?**

A) 2 B) 1 C) 0 D) – 1 E) – 2

4. $0<x<\frac{\pi}{2}$

$\tan x=\frac{3}{5}$

$\Rightarrow$ **cosx = ?**

A) $\frac{3\sqrt{34}}{34}$ B) $\frac{5\sqrt{34}}{34}$ C) $\frac{4}{5}$ D) $\frac{3}{5}$ E) 1

5. $26\alpha=\pi$

$\Rightarrow \frac{\sin 6\alpha\cdot\tan 4\alpha}{\cot 9\alpha\cdot\cos 7\alpha}=?$

A) 26 B) 13 C) 12 D) 6 E) 1

6. $x\in\left(\frac{\pi}{2},\pi\right)$

$\sin x=\frac{1}{3}$

$\Rightarrow$ **cotx = ?**

A) $2\sqrt{2}$ B) $-\frac{\sqrt{2}}{2}$ C) $-2\sqrt{2}$ D) – 3 E) $\frac{\sqrt{2}}{2}$

7. $\cos 60\pi+\frac{\sin(\theta-\pi)\cdot\cos\left(\frac{3\pi}{2}-\theta\right)}{\cos(-\theta)\cdot\sin\left(\frac{17\pi}{2}-\theta\right)}=?$

A) $\sec^2\theta$ B) $\operatorname{cosec}^2\theta$ C) $\cot\theta$ D) $\tan\theta$ E) $\cos\theta$

8. $\sin\alpha+\cos\alpha=\frac{3}{2}$

$\Rightarrow$ **$\sin\alpha\cdot\cos\alpha$ = ?**

A) $\frac{5}{4}$ B) $\frac{5}{8}$ C) $\frac{1}{4}$ D) $\frac{1}{8}$ E) $\frac{9}{4}$

9. $f(x) = 2\sin x - 4$

$f(x) = f(x + T)$

$\Rightarrow$ **min(T) = ?**

A) $\frac{\pi}{2}$ B) π C) $\frac{3\pi}{2}$ D) 2π E) 4π

10. $g(x) = \sin^3(3x + 1) + 7$

$g(x) = g(x + T)$

$\Rightarrow$ **min(T) = ?**

A) $\frac{\pi}{3}$ B) $\frac{2\pi}{3}$ C) 2π D) 3π E) 6π

11. $h(x) = 3 - 7\cos^6(5x + 1)$

$h(x) = h(x + T)$

$\Rightarrow$ **min(T) = ?**

A) $\frac{\pi}{3}$ B) $\frac{\pi}{5}$ C) $\frac{\pi}{6}$ D) $\frac{2\pi}{5}$ E) π

12. $f(x) = \cos^{10}(ax + 8)$

$f(x) = f(x + T)$

$\min(T) = a$

$\Rightarrow$ **a = ?**

A) $-\sqrt{\pi}$ B) $-\pi$ C) $\sqrt{\pi}$ D) π E) $\frac{\sqrt{\pi}}{2}$

13. $n \in Z^+$

$f(x) = \cos^n(2^n \cdot x)$

$f(x) = f(x + T)$

$\min(T) = \frac{\pi}{64}$

$\Rightarrow$ $\sum n = ?$

A) 10 B) 11 C) 12 D) 13 E) 14

14. $f(x) = 5\tan^5\left(\frac{3x + \frac{\pi}{3}}{2}\right)$

$f(x) = f(x + T)$

$\Rightarrow$ **min(T) = ?**

A) $\frac{8\pi}{3}$ B) $\frac{7\pi}{3}$ C) $\frac{2\pi}{3}$ D) $\frac{\pi}{3}$ E) π

15. $g(x) = 5 + \cot\left(\frac{x}{\pi}\right)$

$g(x) = g(x + T)$

$\Rightarrow$ **min(T) = ?**

A) π B) π^2 C) π^3 D) $\frac{1}{\pi}$ E) 1

16. $f(x) = \sin(2x + 5) + \cos^2(5x + 6)$

$f(x) = f(x + T)$

$\Rightarrow$ **min(T) = ?**

A) π B) $\frac{\pi}{2}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{5}$ E) 2π

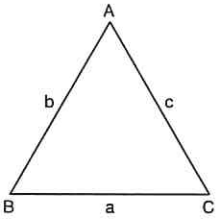
1-B 2-A 3-A 4-B 5-E 6-C 7-A 8-B 9-D 10-B 11-B 12-C 13-D 14-C 15-B 16-A

TEST 3

1. $\cot 1° \cdot \cot 89° + \cot 2° \cdot \cot 88° + \cot 3° \cdot \cot 87° + \ldots + \cot 40° \cdot \cot 50° = ?$

A) 50 B) 40 C) 20 D) 10 E) 0

2.



$\Rightarrow \cos\hat{A} + \cos(\hat{B} + \hat{C}) = ?$

A) – 1 B) 0 C) 1 D) 2 E) $\sqrt{3}$

3. $\dfrac{\sin(53\pi - x) - \sin(68\pi - x)}{\cos(77\pi + x) - \cos(-x)} = ?$

A) – cotx B) cotx C) tanx D) – tanx E) 1

4. $A + B = \dfrac{\pi}{6}$

$\sin(3A + 2B) = \dfrac{4}{5}$

$\Rightarrow$ **cotB = ?**

A) $\frac{4}{3}$ B) $\frac{3}{4}$ C) $\frac{4}{5}$ D) $\frac{5}{4}$ E) 1

5. $0 < x < \dfrac{\pi}{2}$

$\sin x = \dfrac{5}{13}$

$\Rightarrow \dfrac{1 + \sin x \cdot \cos x}{\sin^3 x - \cos^3 x} = ?$

A) $-\frac{7}{13}$ B) $-\frac{13}{7}$ C) 0 D) 1 E) – 1

6. $\dfrac{3\cos x - \sin x}{\sin x + \cos x} = \dfrac{1}{3}$

$\Rightarrow$ **sinx . cosx = ?**

A) $\frac{1}{5}$ B) $\frac{1}{3}$ C) $\frac{2}{5}$ D) $\frac{2}{3}$ E) 1

7. $\arcsin(-1) + \arccos(0) = ?$

A) $-\frac{\pi}{2}$ B) 0 C) $\frac{\pi}{2}$ D) π E) 2π

8. $\cot(\text{arc}\cot 2) + \arctan(\tan 3) = ?$

A) 0 B) 1 C) 2 D) 3 E) 5

9. $\arccos(\cos(2x-7)) = x+5$

$\Rightarrow$ **x = ?**

A) 12 B) 10 C) 8 D) 6 E) 4

10. $\cos\left(\text{arc sin}\,\frac{5}{13}\right) = ?$

A) $\frac{5}{12}$ B) $\frac{7}{12}$ C) $\frac{12}{13}$ D) $\frac{12}{7}$ E) $\frac{12}{5}$

11. $\sin\left(\frac{\pi}{2} - \text{arc tan}\,\frac{1}{2}\right) = ?$

A) $\frac{\sqrt{5}}{5}$ B) $\frac{2\sqrt{5}}{5}$ C) $\frac{1}{2}$ D) 2 E) 5

12. $\arccos\frac{x}{2} = \arcsin(x-1)$

$\Rightarrow \sum x = ?$

A) $\frac{3}{5}$ B) $\frac{4}{5}$ C) $\frac{6}{5}$ D) $\frac{7}{5}$ E) $\frac{8}{5}$

13. $A = \arccos(a^2 - 2a + 1)$

$\Rightarrow$ **min(A) = ?**

A) 0 B) $\frac{\pi}{2}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{4}$ E) $\frac{\pi}{6}$

14. $f(x) = \arcsin(3x-5)$

$\Rightarrow$ **? ≤ x ≤ ?**

A) $2 \le x \le \frac{4}{3}$ B) $\frac{4}{3} \le x \le 2$ C) $\frac{3}{5} \le x \le 1$

D) $\frac{1}{5} \le x \le \frac{3}{5}$ E) $\frac{1}{2} \le x \le \frac{3}{2}$

15. $\text{arc sin}\,\frac{8}{17} + \text{arc cos}\,\frac{8}{17} = ?$

A) 2π B) π C) $\frac{\pi}{2}$ D) $\frac{\pi}{4}$ E) $\frac{\pi}{6}$

16. $f(x, y) = x^4 + 2x^2y^2 + y^4 - 5$

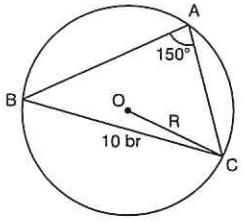
$\Rightarrow$ **f(cosx, sinx) = ?**

A) – 5 B) – 4 C) 0 D) 4 E) 5

1-B 2-B 3-D 4-A 5-B 6-C 7-B 8-E 9-A 10-C 11-B 12-E 13-A 14-B 15-C 16-B

TEST 4

1.

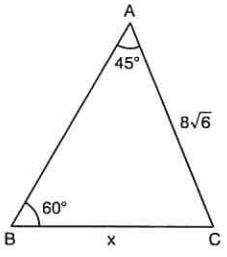


O merkez (center)

⇒ **R = ?**

A) 5 B) 10 C) 15 D) 20 E) 40

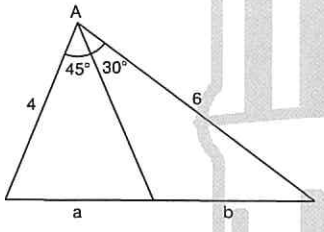
2.



⇒ **x = ?**

A) 4 B) 8 C) 16 D) 32 E) 40

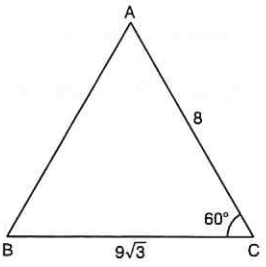
3.



⇒ $\frac{a}{b}$ = ?

A) $\frac{2\sqrt{2}}{3}$ B) $\frac{3\sqrt{2}}{4}$ C) $\frac{\sqrt{2}}{3}$ D) $\frac{\sqrt{2}}{2}$ E) $\sqrt{2}$

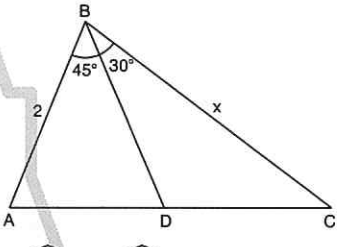
4.



⇒ **A($\widehat{ABC}$) = ?**

A) 32 B) 42 C) 48 D) 54 E) 60

5.

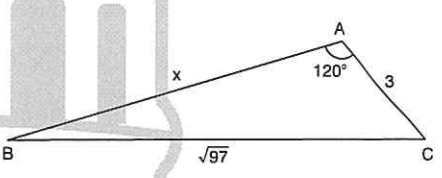


A($\widehat{ABD}$) = A($\widehat{BCD}$)

⇒ **x = ?**

A) $\sqrt{3}$ B) $2\sqrt{2}$ C) $\sqrt{3}$ D) $2\sqrt{3}$ E) $\sqrt{5}$

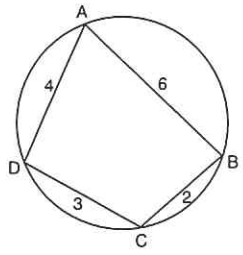
6.



⇒ **x = ?**

A) 12 B) 11 C) 10 D) 9 E) 8

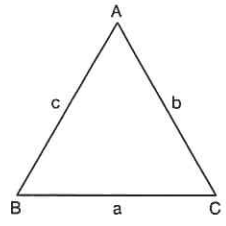
7.



⇒ $\cos(\widehat{ABC}) = ?$

A) $\frac{2}{3}$ B) $\frac{3}{5}$ C) $\frac{5}{16}$ D) $\frac{16}{17}$ E) $\frac{17}{18}$

8.

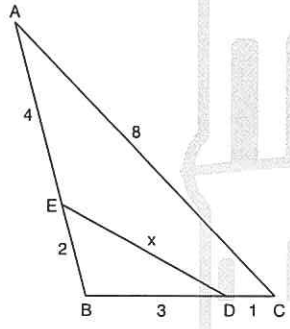


$$a + b + c = \frac{a \cdot b}{a + b - c}$$

⇒ $m(\widehat{ACB}) = ?$

A) 30° B) 60° C) 90° D) 120° E) 150°

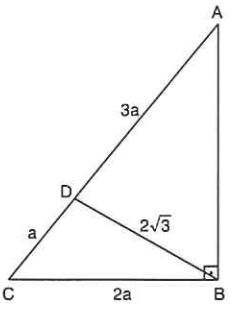
9.



⇒ $x = ?$

A) 2 B) 3 C) 4 D) $\frac{11}{4}$ E) $\frac{11}{3}$

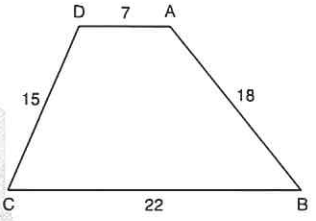
10.



⇒ $a = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

11.

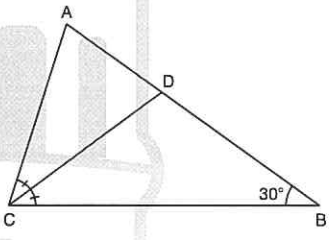


ABCD yamuk (trapezoid)

⇒ $\sin(\widehat{ABC}) = ?$

A) $\frac{1}{2}$ B) $\frac{3}{5}$ C) $\frac{4}{5}$ D) $\frac{4}{3}$ E) $\sqrt{2}$

12.



$9|BD| = 4|AB|$

⇒ $\text{cosec}(\widehat{CAB}) = ?$

A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) $\frac{2}{5}$ D) $\frac{5}{2}$ E) $\frac{2}{3}$

1-B 2-C 3-A 4-D 5-B 6-E 7-C 8-D 9-C 10-A 11-C 12-D

TEST 5

1. $m(\widehat{A}) = 12° 59' 37''$

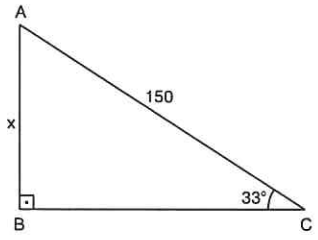
$m(\widehat{B}) = 48° 51' 45''$

$\Rightarrow$ **$m(\widehat{A}) + m(\widehat{B}) = ?$**

A) $60° 59' 22''$ B) $60° 50' 22''$ C) $61° 41' 22''$

D) $61° 51' 22''$ E) $62° 31' 12''$

2.



$\cos 57° \cong 0{,}54$

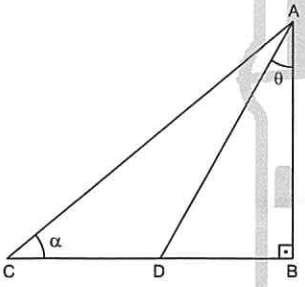
$\Rightarrow$ **$x = ?$**

A) 80 B) 81 C) 82 D) 83 E) 85

3. **$\tan(135°) + \sin(-150°) \cdot \cos(300°) = ?$**

A) $-\frac{5}{4}$ B) $-\frac{3}{4}$ C) $-\frac{1}{4}$ D) $\frac{3}{4}$ E) $\frac{5}{4}$

4.



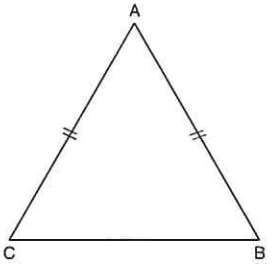
$\sin\alpha = \frac{8}{17}$

$2|CD| = 3|BD|$

$\Rightarrow$ **$\cos\theta = ?$**

A) $\frac{4}{5}$ B) $\frac{5}{6}$ C) $\frac{2}{3}$ D) $\frac{3}{4}$ E) $\frac{1}{2}$

5.



$\cos\widehat{A} = \frac{8}{17}$

$\Rightarrow$ **$\tan\widehat{B} = ?$**

A) $\frac{3}{5}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) $\frac{15}{17}$ E) $\frac{5}{3}$

6. $x \in R$,

$f(x + 3) = f(x)$

$f(0) = 5$

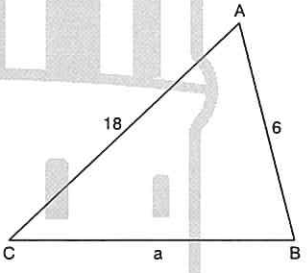
$f(1) = -4$

$f(2) = 7$

$\Rightarrow$ **$f(2015) + f(2017) + f(2020!) = ?$**

A) 9 B) 8 C) 7 D) 1 E) 0

7.



$|AB| = 18$

$|AC| = 6$

$|BC| = a$

$\Rightarrow$ **$a \cos\widehat{B} + 18 \cdot \cos\widehat{A} = ?$**

A) 12 B) 15 C) 16 D) 6 E) 5

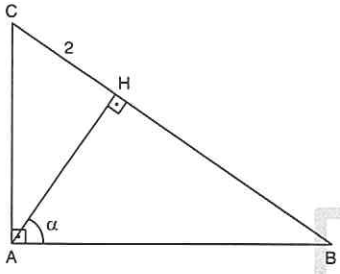
8. $0° < x < 90°$

$$\frac{1 + \sin x}{1 - \sin x} = 4$$

$$\Rightarrow \frac{1 + \cos x}{1 - \cos x} = ?$$

A) $\frac{1}{4}$ B) $\frac{2}{5}$ C) 1 D) 5 E) 9

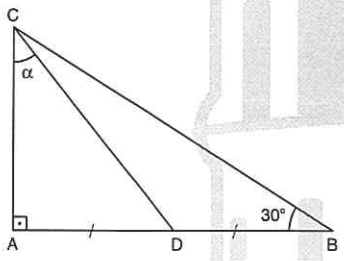
9.



$$\Rightarrow |AC| = ?$$

A) $2\tan\alpha$ B) $2\sec\alpha$ C) $\frac{\operatorname{cosec}\alpha}{2}$ D) $\frac{\sec\alpha}{2}$ E) $2\cos\alpha$

10.



$m(\widehat{ABC}) = 30°$, $m(\widehat{ACD}) = \alpha$

$$\Rightarrow \tan\alpha = ?$$

A) $\frac{1}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\sqrt{3}$ E) $2\sqrt{3}$

11. $a + b = \frac{3\pi}{4}$

$$\cos b = \frac{\sqrt{3}}{3}$$

$$\Rightarrow \cos(2a + 3b) = ?$$

A) $\frac{\sqrt{3}}{3}$ B) $\frac{\sqrt{2}}{3}$ C) $\frac{\sqrt{6}}{3}$ D) $-\frac{\sqrt{3}}{3}$ E) $-\frac{\sqrt{6}}{3}$

12. $x \in R^-$

$$\operatorname{arcsec} 4x = \arccos x$$

$$\Rightarrow x = ?$$

A) $-\frac{1}{4}$ B) $-\frac{1}{2}$ C) -1 D) -2 E) $\frac{1}{2}$

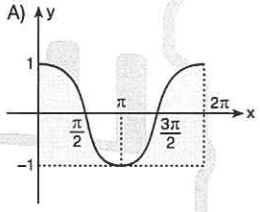
13. $f = \{(x, y): -1 < y \leq \sin x \quad x, y \in R\}$

$x \in [0, 2\pi]$

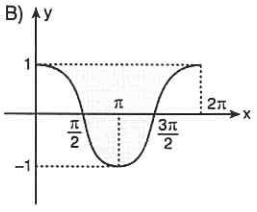
f nin grafiği aşağıdakilerden hangisi olabilir?

Which one of the following can be the graph of f?

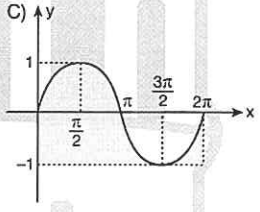
A)



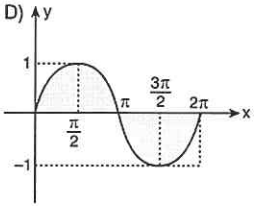
B)



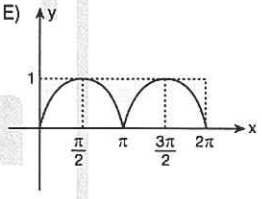
C)



D)

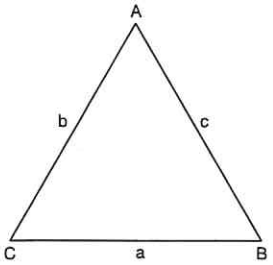


E)



1-D 2-B 3-A 4-A 5-E 6-B 7-D 8-E 9-B 10-C 11-C 12-B 13-C

1.

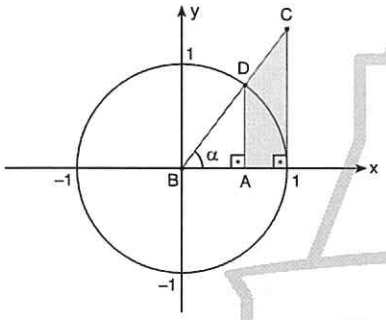


$$\frac{m(\hat{A})}{2} = \frac{m(\hat{B})}{3} = \frac{m(\hat{C})}{7}$$

$$\Rightarrow \frac{a}{b} = ?$$

A) $\frac{1}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{5}}{2}$ E) 1

2.



$$\Rightarrow A(ABCD) = ?$$

A) $\frac{\sin^3\alpha}{\cos\alpha}$ B) $\frac{\sin^2\alpha}{\cos\alpha}$ C) $\frac{\cos^3\alpha}{2\sin\alpha}$

D) $\frac{\cos^2\alpha}{2\sin\alpha}$ E) $\frac{\sin^3\alpha}{2\cos\alpha}$

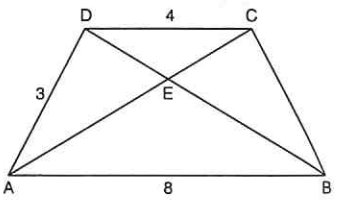
3. $\tan20° = x$

$$\Rightarrow \frac{\tan740° - \tan225°}{\cot250° + \cot160°} = ?$$

A) $\frac{x}{x-1}$ B) $\frac{x-1}{x}$ C) $\frac{x}{x+1}$

D) $\frac{x+1}{x}$ E) x

4.



ABCD yamuk (trapezoid)

$|DC| = 4$, $|AD| = 3$, $|AB| = 8$

$m(\widehat{DAB}) = 30°$

$$\Rightarrow \frac{A(\widehat{DAB})}{A(\widehat{ADC})} = ?$$

A) 5 B) 4 C) 3 D) 2 E) 1

5. $a = \cos10°$

$b = \sin83°$

$c = \cot37°$

$d = \tan15°$

Aşağıdaki sıralamalardan hangisi doğrudur?
Which of the following sequencing is correct?

A) $c > b > a > d$ B) $c > d > b > a$

C) $c > a > b > d$ D) $c > b > d > a$

E) $a > b > c > d$

6. $\frac{\pi}{2} < x < \pi$

$\cot x = -\frac{1}{3}$

$$\Rightarrow \sin x \cdot \cos x - \tan x = ?$$

A) 2,1 B) 2,3 C) 2,5 D) 2,7 E) 3,1

7. $f(x) = 3\sin 2x - 5$

$\Rightarrow f^{-1}(x) = ?$

A) $\arcsin\left(\frac{x+5}{2}\right)$ B) $\frac{1}{2}\arcsin(5x-3)$

C) $\arcsin\left(\frac{x-5}{2}\right)$ D) $\frac{1}{2}\arcsin\left(\frac{x-5}{3}\right)$

E) $\frac{1}{2}\arcsin\left(\frac{x+5}{3}\right)$

8. $0 < x < \frac{\pi}{2}$

$$\frac{\sec(x)-1}{2} = \frac{3}{\sec(x)+1}$$

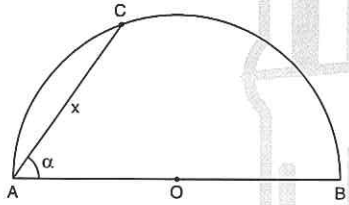
$\Rightarrow \tan(x) = ?$

A) $\sqrt{7}$ B) $\sqrt{6}$ C) $\sqrt{5}$ D) $\sqrt{3}$ E) $\sqrt{2}$

9. $\cos\left[\frac{\pi}{2} + \arctan\left(-\frac{3}{4}\right)\right] = ?$

A) $\frac{3}{5}$ B) $\frac{4}{5}$ C) $\frac{1}{2}$ D) $\frac{5}{3}$ E) $\frac{5}{4}$

10.



O merkez
O center
$2|AO| = x^2$
$|AC| = x$

$\Rightarrow \cos^2\alpha = ?$

A) x^{-3} B) x^{-2} C) x^{-1}

D) $\frac{x}{x-1}$ E) $\frac{x-5}{x}$

11. $0 < \theta < 90°$

$\Rightarrow \cos(15\pi - \theta) - \sin\left(\theta - \frac{7\pi}{2}\right) = ?$

A) $2\cos\theta$ B) $-2\cos\theta$ C) 0

D) $2\sin\theta$ E) $-2\sin\theta$

12. $\frac{\cos\alpha}{1-\sin\alpha} = \frac{1}{4}$

$\Rightarrow \frac{1+\sin\alpha}{\cos\alpha} = ?$

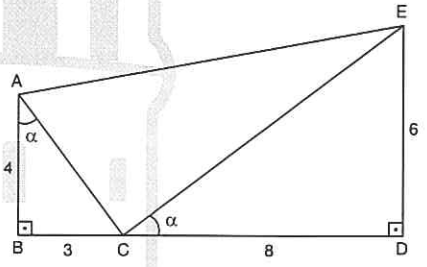
A) 1 B) 2 C) $\frac{1}{2}$ D) $\frac{1}{4}$ E) 4

13. $\sin x - \cos x = \frac{1}{2}$

$\Rightarrow \sin^3 x - \cos^3 x = ?$

A) $\frac{11}{2}$ B) $\frac{11}{8}$ C) $\frac{11}{16}$ D) $\frac{7}{8}$ E) $\frac{7}{16}$

14.



$\Rightarrow \tan(\widehat{AEC}) = ?$

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{3}}{2}$

1-B 2-E 3-C 4-D 5-A 6-D 7-E 8-B 9-A 10-B 11-B 12-D 13-C 14-C

TEST 7

1. $\dfrac{\sin73^\circ \cdot \cos13^\circ - \cos73^\circ \cdot \sin13^\circ}{\cos64^\circ \cdot \cos4^\circ + \sin64^\circ \cdot \sin4^\circ} = ?$

A) $\sqrt{3}$ B) $\dfrac{\sqrt{3}}{2}$ C) $\dfrac{\sqrt{2}}{2}$ D) $\sqrt{2}$ E) 1

2. $\dfrac{\cot43^\circ - \tan17^\circ}{1 + \tan47^\circ \cdot \cot73^\circ} = ?$

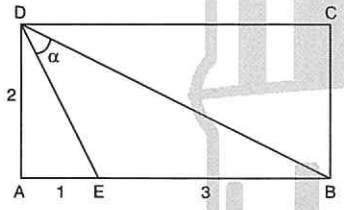
A) $\sqrt{3}$ B) $\dfrac{\sqrt{3}}{3}$ C) $\dfrac{\sqrt{3}}{2}$ D) $\tan26^\circ$ E) 1

3. $\cos35^\circ = x$

$\Rightarrow$ **$\cos250^\circ = ?$**

A) $1 - 2x^2$ B) $2x^2 - 1$ C) $x^2 - 1$ D) $1 - x^2$ E) $2x - 1$

4.



ABCD dikdörtgen (rectangle)

$\Rightarrow$ **$\tan\alpha = ?$**

A) $\dfrac{4}{3}$ B) 2 C) 3 D) $\dfrac{1}{3}$ E) $\dfrac{3}{4}$

5. $\dfrac{\tan105^\circ}{1 - \tan^2105^\circ} = ?$

A) $\dfrac{\sqrt{3}}{2}$ B) $\dfrac{\sqrt{3}}{3}$ C) $\dfrac{\sqrt{3}}{6}$ D) $-\dfrac{\sqrt{3}}{3}$ E) $-\dfrac{\sqrt{3}}{6}$

6. $\tan x = -2$

$\cot y = 3$

$\Rightarrow$ **$x + y = ?$**

A) 45° B) 60° C) 75° D) 120° E) 135°

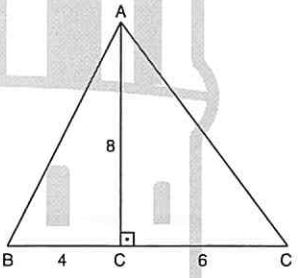
7. $\dfrac{\pi}{2} < x < \pi$

$\sin x + \cos x = \dfrac{2}{5}$

$\Rightarrow$ **$\sin2x = ?$**

A) $\dfrac{21}{25}$ B) $\dfrac{4}{5}$ C) $\dfrac{1}{5}$ D) $-\dfrac{4}{5}$ E) $-\dfrac{21}{25}$

8.



$|BD| = 4$

$|DC| = 6$

$|AD| = 8$

$\Rightarrow$ **$\cot(\widehat{BAC}) = ?$**

A) 3 B) 2 C) 1 D) $\dfrac{1}{2}$ E) $\dfrac{1}{3}$

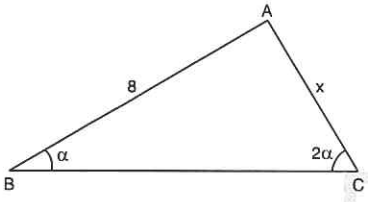
9. $22x = \pi$

$$\frac{\sin x \cdot \cos 6x + \sin 6x \cdot \cos x}{\cos 6x \cdot \cos 2x + \sin 6x \cdot \sin 2x} = ?$$

A) tan7x B) cot7x C) 1

D) 0 E) – 1

10.

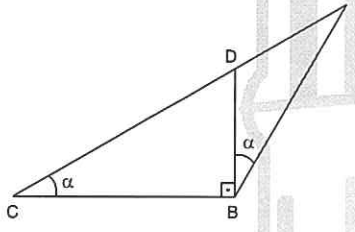


$\cos\alpha = \frac{4}{5}$

$\Rightarrow$ **x = ?**

A) 9 B) 7 C) 6 D) 5 E) 3

11.



$m(\widehat{BCD}) = \alpha$

$m(\widehat{ABD}) = \alpha$

$|AB| = 3$ br

$|AC| = 9$ br

$\Rightarrow$ **sinα = ?**

A) $\frac{\sqrt{10}}{10}$ B) $\frac{3\sqrt{10}}{10}$ C) $\sqrt{5}$ D) $\frac{\sqrt{5}}{2}$ E) $\frac{\sqrt{3}}{2}$

12. $\sin(x - 72°) \cdot \cos(42° - x) + \sin(42° - x) \cdot \cos(x - 72°) = ?$

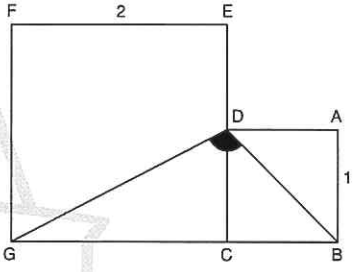
A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$ E) 0

13. $\frac{\cos 4x - 1}{\sin 4x} = ?$

A) tan2x B) cot2x C) 1

D) – tan2x E) – cot2x

14.



ABCD ve CEFG kare

ABCD and CEFG square

$|AB| = 1$ $|EF| = 2$

$\Rightarrow$ **tan($\widehat{GDB}$) = ?**

A) – 1 B) – 2 C) – 3 D) – 4 E) – 5

15. $\frac{\sin 9°}{\cos 3°} + \frac{\cos 9°}{\sin 3°} = ?$

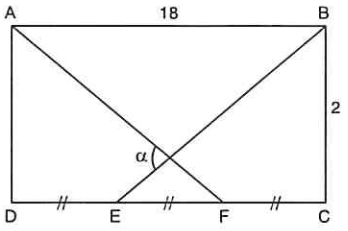
A) cot6° B) 2tan6° C) sin3°

D) 2sin6° E) 2cot6°

1-A 2-B 3-A 4-E 5-C 6-E 7-E 8-D 9-C 10-D 11-A 12-B 13-D 14-C 15-E

TEST 8

1.



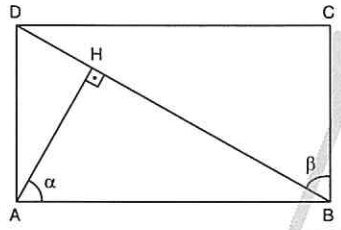
ABCD dikdörtgen (rectangle)

$|DE| = |EF| = |FC|$, $|AB| = 18$, $|BC| = 2$

⇒ **$\tan\alpha$ = ?**

A) $\frac{10}{33}$ B) $\frac{12}{35}$ C) $\frac{1}{9}$ D) $\frac{2}{9}$ E) 1

2.



ABCD dikdörtgen (rectangle)

$|DH| = 4$, $|BH| = 9$

$m(\widehat{HAB}) = \alpha$, $m(\widehat{CBH}) = \beta$

⇒ **$\sin(\alpha + \beta)$ = ?**

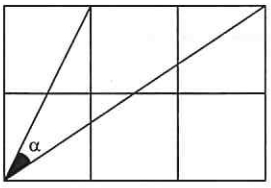
A) $\frac{\sqrt{3}}{3}$ B) $\frac{2\sqrt{3}}{13}$ C) $\frac{12}{13}$ D) $\frac{12}{5}$ E) $-\frac{12}{5}$

3. $\cos 77° = m$

⇒ **$\sin 64°$ = ?**

A) $2m^2 - 1$ B) $m - 1$ C) m^2 D) $1 + m$ E) $1 - 2m^2$

4.



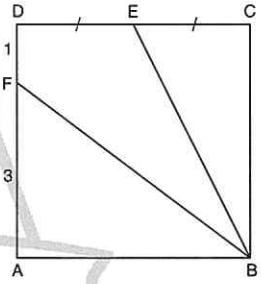
Şekil eş karelerden oluşmuştur.

The figure consists of congruent squares.

⇒ **$\cot\alpha$ = ?**

A) 2 B) $\frac{7}{4}$ C) $\frac{4}{7}$ D) $\frac{2}{7}$ E) $\frac{4}{17}$

5.



ABCD kare (square)

$|DE| = |EC|$, $|AF| = 3$, $|DF| = 1$

⇒ **$\cos(\widehat{EBF})$ = ?**

A) $\frac{1}{2}$ B) $\frac{\sqrt{5}}{5}$ C) $\frac{2\sqrt{5}}{5}$ D) $\frac{\sqrt{3}}{2}$ E) $\frac{3}{4}$

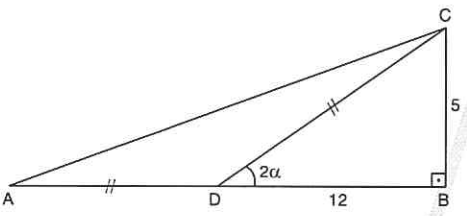
6. $\dfrac{\sin\frac{\pi}{5}}{\sin\frac{\pi}{10}} = ?$

A) $2\sin\frac{\pi}{10}$ B) $2\sin\frac{\pi}{5}$ C) $2\cos\frac{\pi}{10}$ D) $2\cos\frac{\pi}{5}$ E) $\sin\frac{\pi}{5}$

7. $\frac{\sin\alpha}{1+\cos\alpha} + \cot\frac{\alpha}{2} = ?$

A) $2\sin\alpha$ B) $2\cos\alpha$ C) $2\sec\alpha$ D) $2\operatorname{cosec}\alpha$ E) 2

8.



$|AD| = |CD|$

$\Rightarrow$ $\tan\alpha = ?$

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{1}{6}$ E) $\frac{1}{7}$

9. $\cos15° + \sqrt{3} \cdot \sin15° = ?$

A) $\frac{1}{2}$ B) $\sqrt{2}$ C) $\frac{\sqrt{3}}{2}$ D) 1 E) $\frac{3}{2}$

10. $\frac{\sin2x}{\sin^2x - \cos^2x} = \frac{3}{7}$

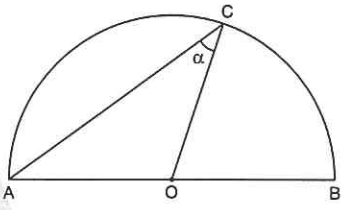
$\Rightarrow$ $\tan2x = ?$

A) $\frac{7}{3}$ B) $-\frac{7}{3}$ C) $\frac{3}{7}$ D) $-\frac{3}{7}$ E) 1

11. $\frac{(\cos15° - \sin15°) \cdot (\cos15° + \sin15°)}{\sin22{,}5° \cdot \cos22{,}5°} = ?$

A) $\sqrt{6}$ B) $\sqrt{3}$ C) $\frac{\sqrt{2}}{3}$ D) $\frac{\sqrt{3}}{2}$ E) $\frac{2\sqrt{3}}{3}$

12.



O merkez

O center

$|AO| = 1$ br

$\Rightarrow$ **A(AOC) = ?**

A) $\frac{\sin2\alpha}{2}$ B) $\sin2\alpha$ C) $\sin\alpha$ D) $\tan\alpha$ E) $\tan\frac{\alpha}{2}$

13. $\cos10° = 16a$

$\Rightarrow$ **$\cos10° \cdot \cos20° \cdot \cos40° \cdot \cos80° = ?$**

A) 16a B) 8a C) 4a D) 2a E) a

14. $135° < \alpha < 180°$

$\Rightarrow$ $\frac{\cos2\alpha}{\sqrt{1+\sin2\alpha}} = ?$

A) $\cos\alpha - \sin\alpha$ B) $\sin\alpha - \cos\alpha$ C) $\sin\alpha + \cos\alpha$ D) $\tan\alpha$ E) 0

1-B 2-C 3-E 4-B 5-C 6-C 7-D 8-C 9-B 10-D 11-A 12-A 13-D 14-B

TEST 9

1. $\frac{\sin75° - \sin15°}{\sin75° + \sin15°} = ?$

A) $\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{3}}{3}$ C) $\frac{\sqrt{2}}{2}$ D) 1 E) – 1

2. $\frac{\sin3° + \sin9° + \sin15°}{\cos3° + \cos9° + \cos15°} = ?$

A) 1 B) sin9° C) cos9°
D) tan9° E) cot9°

3. $\frac{\sin2\alpha + \sin4\alpha + \sin6\alpha}{1 + \cos2\alpha + \cos4\alpha} = ?$

A) $\sin2\alpha$ B) $\cos2\alpha$ C) $2\sin2\alpha$
D) $2\cos2\alpha$ E) $\cot2\alpha$

4. $a + b = 90°$

$\frac{\sin a° - \sin b°}{\cos b° - \cos a°} = ?$

A) 1 B) 0 C) – 1
D) $\sin a°$ E) $\tan a°$

5. $\frac{\cos3x + \cos5x}{\sin3x - \sin5x} = ?$

A) tanx B) cotx C) 1
D) – tanx E) – cotx

6. $\frac{1 + \cos7° + \cos14°}{\sin7° + \sin14°} = ?$

A) $\tan7°$ B) $\cot7°$ C) $\sin7°$
D) $\cos7°$ E) $\cot14°$

7. $\frac{\sin25° \cdot \sin65°}{\sin50°} = ?$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{4}$ D) $-\frac{1}{2}$ E) – 1

8. $\sin x = \frac{\sqrt{5}}{5}$

$\Rightarrow \cos\left(\frac{\pi}{4} + x\right) \cdot \cos\left(\frac{\pi}{4} - x\right) = ?$

A) $\frac{4}{5}$ B) $\frac{3}{5}$ C) $\frac{2}{5}$ D) $\frac{1}{5}$ E) $\frac{3}{10}$

9. $\sin20° \cdot \sin40° \cdot \sin60° \cdot \sin80° = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{3}{16}$ D) $\frac{3}{8}$ E) $\frac{3}{4}$

10. $\cos^2(x - y) + \sin^2(x + y) = ?$

A) $1 + \sin x \cdot \cos x$ B) $1 - \sin x \cdot \cos x$

C) $1 + \sin2x \cdot \sin2y$ D) $1 - \sin2x \cdot \sin2y$

E) $1 + \cos2x \cdot \sin2y$

11. $0 < x < \frac{\pi}{2}$

$\tan x = \frac{1 + \cot65°}{1 - \cot65°}$

$\Rightarrow$ **x = ?**

A) 20° B) 40° C) 50° D) 60° E) 70°

12. $0 < x < \frac{\pi}{2}$

$1 + \sin2x = 2\cos^220°$

$\Rightarrow$ **S. S. = ?**

A) $\{10°, 20°\}$ B) $\{20°, 40°\}$ C) $\{25°, 65°\}$

D) $\{15°, 35°\}$ E) $\{55°, 65°\}$

13. $A = 3\sin x + 4\cos x$

$\Rightarrow$ **min(A) . max(A) = ?**

A) 5 B) 10 C) 15 D) – 25 E) – 49

14. $2\sin(20° - \alpha) - 1 = 0$

$x \in \left(\frac{3\pi}{2}, 2\pi\right)$

$\Rightarrow$ **x = ?**

A) 350° B) 345° C) 340° D) 335° E) 320°

15. $x \in (0, 2\pi)$

$2\cos^2x + 5\cos x = 3$

$\Rightarrow$ **S. S. = ?**

A) $\{30°, 330°\}$ B) $\{60°, 300°\}$ C) $\{45°, 315°\}$

D) $\{270°\}$ E) $\varnothing$

16. $x \in \left(\frac{\pi}{2}, \pi\right)$

$$\frac{1 - \cot\left(\frac{\pi}{2} - x\right)}{\sin x - \sin\left(\frac{\pi}{2} - x\right)} = 2$$

$\Rightarrow$ **x = ?**

A) 75° B) 100° C) 120° D) 135° E) 150°

1-B 2-D 3-C 4-A 5-E 6-B 7-B 8-E 9-C 10-C 11-E 12-C 13-D 14-A 15-B 16-C

TEST 10

1. $0 < x < 2\pi$

$\cot(x - 20°) \cdot \cot 55° = 1$

$\Rightarrow \Sigma x = ?$

A) $\frac{\pi}{9}$ B) $\frac{\pi}{8}$ C) $\frac{7\pi}{9}$ D) $\frac{14\pi}{9}$ E) $\frac{29\pi}{18}$

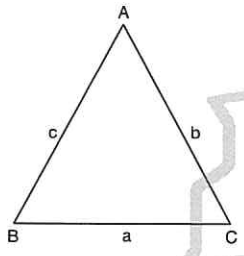
2. $3\cos^2 x + 2\sin x \cdot \cos x - \sin^2 x = 0$

$x \in \left(\frac{\pi}{2}, \pi\right)$

$\Rightarrow x = ?$

A) $\frac{2\pi}{3}$ B) $\frac{3\pi}{4}$ C) $\frac{4\pi}{5}$ D) $\frac{5\pi}{7}$ E) $\frac{\pi}{13}$

3.



$\sin\hat{A} = \cos\hat{B} + \cos\hat{C}$

$\Rightarrow m(\hat{B}) = ?$

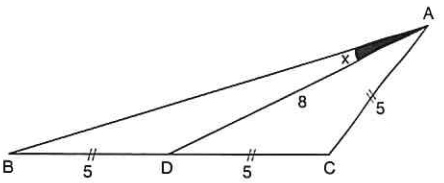
A) 30° B) 45° C) 60° D) 90° E) 120

4. $f(\tan x) = \frac{1 + \tan^2 x}{1 + \cot^2 x}$

$\Rightarrow f(\cos x) = ?$

A) $\sin^2 x$ B) $\cos^2 x$ C) secx D) cosecx E) $\cot^2 x$

5.



$\Rightarrow \cot x = ?$

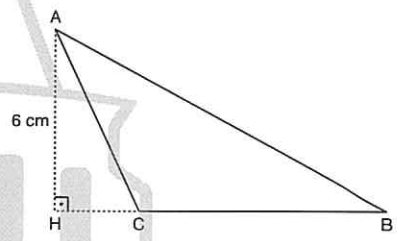
A) 2 B) 4 C) 6 D) 8 E) 10

6. $x + y + z = \pi$

$\Rightarrow \cos x + \cos y \cdot \cos z - \sin y \cdot \sin z = ?$

A) $\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{1}{2}$ D) 1 E) 0

7.



$|AH| = 6$ cm, $\cot\hat{B} + \cot\hat{C} = \frac{5}{3}$

$\Rightarrow A(ABC) = ?$

A) 30 cm^2 B) 20 cm^2 C) 10 cm^2 D) 8 cm^2 E) 5 cm^2

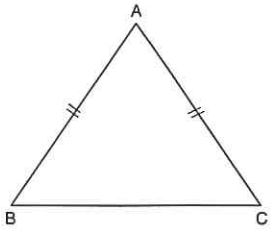
8. $\tan(a + b) = 33$

$\tan(a - b) = 3$

$\Rightarrow \tan 2b = ?$

A) 0,1 B) 0,2 C) 0,3 D) 0,4 E) 0,5

9.



$\widehat{A} > 90°$

$\sin\widehat{A} = 0{,}6$

$\Rightarrow$ **$\tan(\widehat{A} + \widehat{B}) = ?$**

A) $-\frac{1}{3}$ B) -1 C) -3 D) 1 E) $\frac{1}{3}$

10. $0 < x < \frac{\pi}{2}$

$\Rightarrow$ **$\sqrt{2.\cot x + \operatorname{cosec}^2 x} = ?$**

A) $1 + \sec x$ B) $\operatorname{cosec} x$ C) 1

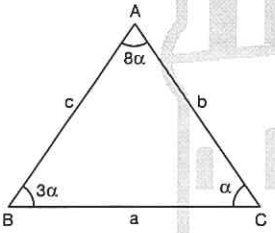
D) $1 + \tan x$ E) $1 + \cot x$

11. $x + y = \frac{\pi}{4}$

$\Rightarrow$ **$(1 + \tan x) \cdot (1 + \tan y) = ?$**

A) 0 B) 1 C) 2 D) $\sqrt{2}$ E) $\sqrt{3}$

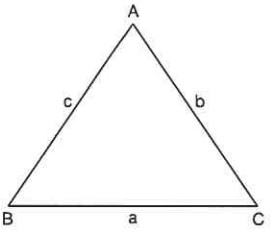
12.



$\Rightarrow$ **$\frac{a}{b} = ?$**

A) $\frac{8}{3}$ B) $\frac{8}{5}$ C) $\frac{\sqrt{6}}{2}$ D) $\sqrt{3}$ E) $\frac{2\sqrt{6}}{3}$

13.



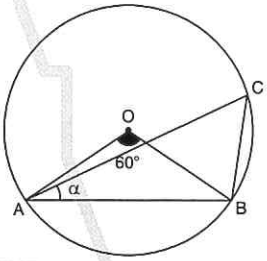
$\Rightarrow$ **$\tan\widehat{A} + \tan\widehat{B} + \tan\widehat{C} = ?$**

A) $\tan(\widehat{A} \cdot \widehat{B} \cdot \widehat{C})$ B) $\tan(\widehat{A} + \widehat{B} + \widehat{C})$

C) $\tan\widehat{A} \cdot \tan\widehat{B} \cdot \tan\widehat{C}$ D) 1

E) -1

14.



$|AB| = 12$ br

$|BC| = 8$ br

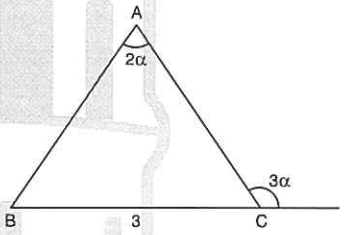
$m(\widehat{AOB}) = 60°$

$m(\widehat{CAB}) = \alpha$

$\Rightarrow$ **$\sin\alpha = ?$**

A) $\frac{1}{3}$ B) $\frac{1}{4}$ C) $\frac{1}{5}$ D) $\frac{1}{6}$ E) $\frac{1}{2}$

15.



$|BC| = 3$ br, $\cos(\widehat{CBA}) = \frac{3}{4}$

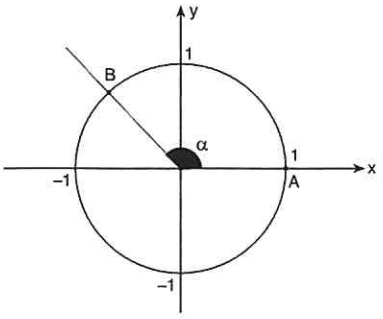
$\Rightarrow$ **$|AC| = ?$**

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

1-E 2-B 3-D 4-B 5-B 6-E 7-A 8-C 9-A 10-E 11-C 12-C 13-C 14-A 15-E

TEST 11

1.



$m(\widehat{AOB}) = \alpha$

$B\left(b, \frac{\sqrt{3}}{2}\right)$

⇒ **b + cosα = ?**

A) – 1 B) 0 C) 1 D) $\frac{1}{2}$ E) $\frac{\sqrt{3}}{2}$

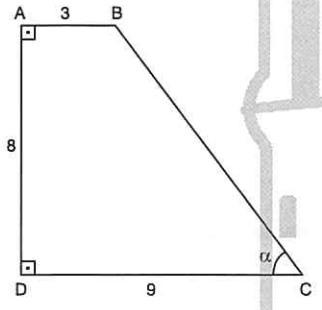
2. **Aşağıdakilerden hangisi sin35°'e eşit değildir?**

Which of the following is not equals to sin35°?

A) sin145° B) – sin325° C) – cos235°

D) cos(– 55°) E) cos125°

3.



$|AB| = 3$ br

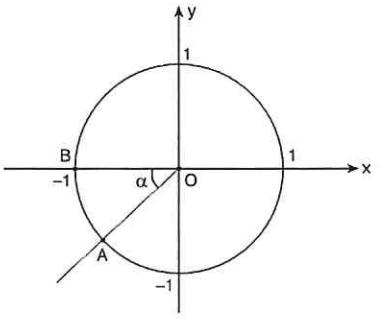
$|AD| = 8$ br

$|DC| = 9$ br

⇒ **secα = ?**

A) $\frac{7}{10}$ B) $\frac{10}{7}$ C) $\frac{5}{3}$ D) $\frac{3}{5}$ E) $\frac{1}{3}$

4.



$m(\widehat{AOB}) = \alpha$

⇒ **A(x, y) = ?**

A) A(cosα, – sinα)

B) A(– cosα, sinα)

C) A(– cosα, sin(– α))

D) A(cos(– α), sin(– α))

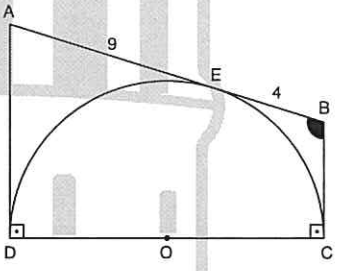
E) A(– sinα, – cosα)

5. $f(x) = \cos^2\left(\frac{\pi}{3} - x\right) + \sin\left(x - \frac{\pi}{3}\right)$

⇒ $\mathbf{f\left(\frac{\pi}{6}\right) = ?}$

A) $-\frac{1}{4}$ B) $-\frac{5}{4}$ C) $\frac{\sqrt{3}-1}{2}$ D) $\frac{1}{4}$ E) $\frac{5}{4}$

6.



$|AE| = 9$ br

$|EB| = 4$ br

O merkez (center)

⇒ **sin($\widehat{EBC}$) = ?**

A) $-\frac{12}{5}$ B) $-\frac{12}{13}$ C) $-\frac{5}{13}$ D) $\frac{5}{13}$ E) $\frac{12}{13}$

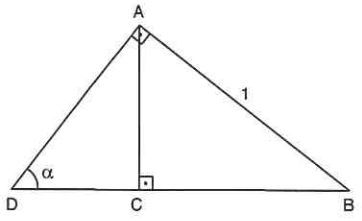
7. $A = 2^{1-3\sin x}$

$A \in Z$

$\Rightarrow \Sigma A = ?$

A) 30 B) 31 C) 130 D) 131 E) 136

8.

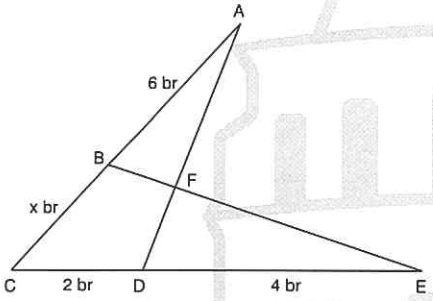


$\Rightarrow |BC| = ?$

A) $\sin\alpha$ B) $\cos\alpha$ C) $\sec\alpha$

D) $\tan\alpha$ E) $\cot\alpha$

9.



$A(\widehat{ABF}) = A(\widehat{DFE})$

$\Rightarrow x = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

10. $\tan\left(\text{arc}\sin\dfrac{2}{x}\right) = ?$

A) $\dfrac{x}{2}$ B) $\dfrac{2}{\sqrt{x^2-4}}$ C) $\dfrac{2}{\sqrt{4-x^2}}$

D) 1 E) $\sqrt{x^2-4}$

11. $\text{arc}\sin(2x) + \text{arc}\cos(1-3x) = \dfrac{\pi}{2}$

$\Rightarrow x = ?$

A) $-\dfrac{1}{3}$ B) $-\dfrac{1}{4}$ C) $-\dfrac{1}{5}$ D) $\dfrac{1}{5}$ E) $\dfrac{1}{4}$

12. **Aşağıdakilerden hangisi tek fonksiyondur?**

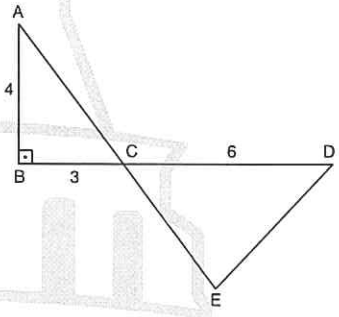
Which of the following is a add function?

A) $f(x) = x^2 + \cot x$ B) $f(x) = x \cdot \sin x$

C) $f(x) = \cos 5x$ D) $f(x) = \sin x - \tan x$

E) $f(x) = 1 + \sin x$

13.



$|AB| = 4$ br

$|AE| = 10$ br

$|CD| = 6$ br

$|BC| = 3$ br

$\Rightarrow A(\widehat{CDE}) = ?$

A) 8 br^2 B) 10 br^2 C) 12 br^2

D) 18 br^2 E) 24 br^2

14. $\sin x = s$

$\cos x = c$

$\Rightarrow s^4 + 6s^2c^2 + c^4 = ?$

A) $1 + \sin 2x$ B) $1 + \sin^2 2x$ C) 1

D) 2 E) $\cos^2 2x$

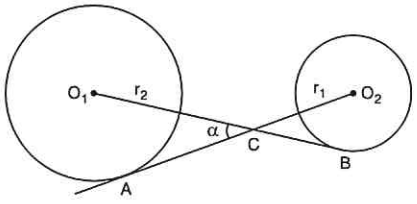
1-A 2-E 3-C 4-C 5-D 6-E 7-E 8-A 9-D 10-B 11-D 12-D 13-C 14-B

TEST 12

1. $\dfrac{\sin(\arctan x)}{\cos(\arctan x)} = ?$

A) $\dfrac{1}{x}$ B) $\sqrt{x}$ C) x D) x^3 E) 1

2.



O_1 ve O_2 merkez (O_1 and O_2 center)

$r_1 = 1$ br, $r_2 = 5$ br, $m(\widehat{ACO_2}) = \alpha$

$|AC| + |BC| = 12$

⇒ **tanα = ?**

A) 1 B) $\dfrac{1}{5}$ C) $\dfrac{1}{4}$ D) $\dfrac{1}{3}$ E) $\dfrac{1}{2}$

3. $a \in R$

⇒ **arc sin$(4a - 5 - a^2)$ = ?**

A) $-\dfrac{\pi}{3}$ B) $-\dfrac{\pi}{2}$ C) $\dfrac{\pi}{2}$ D) $\dfrac{\pi}{3}$ E) 0

4. $a, b \in R$

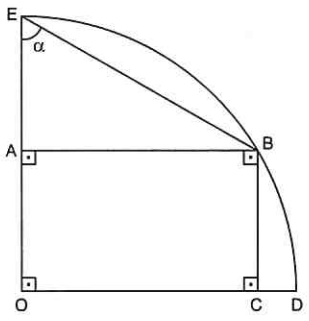
$f(x) = a(\sin x + \cos x) + b(\sin x - \cos x)$

$\max(f(x)) = \sqrt{2}$

⇒ **$a^2 + b^2$ = ?**

A) $\sqrt{3}$ B) $\sqrt{2}$ C) 2 D) 1 E) $\dfrac{\sqrt{2}}{2}$

5.



O merkez (center)

$|BC| = 6$

$|CD| = 2$

ABCD dikdörtgen

ABCD rectangle

⇒ **tanα = ?**

A) 4 B) 3 C) 2 D) 1 E) $\dfrac{9}{7}$

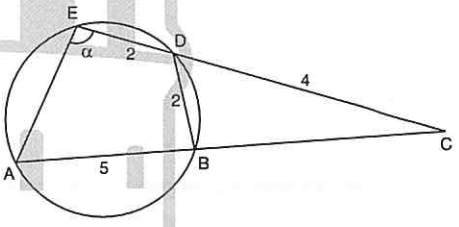
6. $x + y = \dfrac{\pi}{6}$

⇒ **cot(6y − 2x) . cot(5x − 3y) = ?**

A) 1 B) $\dfrac{1}{2}$ C) sec(3x − 3y)

D) cos(3x − 3y) E) tan(3x − 3y)

7.



$|DE| = 2$, $|DB| = 2$, $|AB| = 5$, $|DC| = 4$

⇒ **cosα = ?**

A) $-\dfrac{1}{2}$ B) $-\dfrac{1}{3}$ C) $-\dfrac{1}{4}$ D) $\dfrac{1}{3}$ E) $\dfrac{1}{4}$

8. $f(x) = x^2 + 2x - 5$

$f(\tan\alpha) = f(\tan\beta) = 0$

$\Rightarrow$ **$\tan(\alpha + \beta) = ?$**

A) $-\frac{1}{3}$ B) $-\frac{2}{3}$ C) $-\frac{3}{5}$ D) $-\frac{5}{7}$ E) $-\frac{1}{7}$

9. $f^{-1}(\sec x) = \sin x$

$\Rightarrow$ **$f(x) = ?$**

A) $\frac{1}{1+x^2}$ B) $\frac{1}{\sqrt{1+x^2}}$ C) $\frac{2}{\sqrt{1+x^2}}$

D) $\frac{1}{\sqrt{1-x^2}}$ E) $\frac{x}{\sqrt{1-x^2}}$

10. $0 < \alpha < \frac{\pi}{2}$

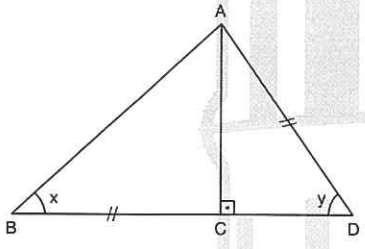
$\tan\theta = \frac{1}{3}$

$\frac{\cos\theta - \sin\theta}{\cos\theta + \sin\theta} = \sin\alpha$

$\Rightarrow$ **$\alpha = ?$**

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{6}$ E) π

11.



$|BC| = |AD|$

$\Rightarrow$ **$\sin y \cdot \cos x = ?$**

A) $\tan x$ B) $\sin x$ C) $\tan y$

D) $\sin y$ E) 1

12. $\frac{1}{2} \cdot \sin 2\alpha = x \cdot \cos\alpha - x^2 + x \cdot \sin\alpha$

S. S $= \{x_1, x_2\}$

$\Rightarrow$ **$x_1^2 + x_2^2 = ?$**

A) $\sin\alpha$ B) $\sin 2\alpha$ C) $2\sin\alpha$ D) -1 E) 1

13. $m = 2(5 - \cos\theta \cdot \sin\theta)$

$n = 8 + \sin 2\theta$

$\Rightarrow$ **$\max(m \cdot n) = ?$**

A) 100 B) 88 C) 81 D) 72 E) 71

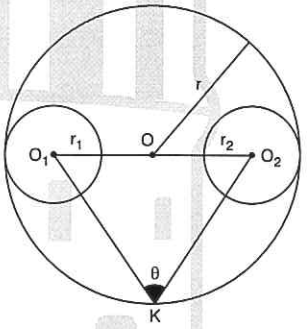
14. $f(x) = \sin 5x$

$f(54° + x) + f(36° - x) = \frac{1}{2}$

$\Rightarrow$ **$f(72° - x) \cdot f(x + 18°) = ?$**

A) $-\frac{3}{8}$ B) $-\frac{2}{7}$ C) $-\frac{1}{8}$ D) $-\frac{1}{7}$ E) -1

15.



$r_1 = r_2$

$r = 4$ br

$|O_1O_2| = 6$ br

$|KO_2| = 5$ br

$\Rightarrow$ **$\sin\theta = ?$**

A) $\frac{3}{25}$ B) $\frac{7}{25}$ C) $\frac{24}{25}$ D) $\frac{1}{5}$ E) 1

1-C 2-E 3-B 4-D 5-C 6-A 7-C 8-A 9-D 10-D 11-B 12-E 13-C 14-A 15-C

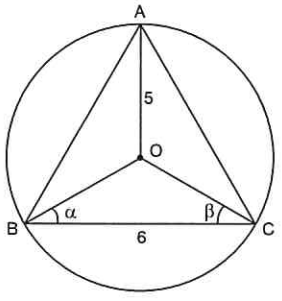
TEST 13

1. arc tan2x = arc cot4x

⇒ $\Pi x = ?$

A) $-\frac{1}{8}$ B) $-\frac{1}{4}$ C) $-\frac{1}{2}$ D) $\frac{1}{2}$ E) $\frac{1}{8}$

2.

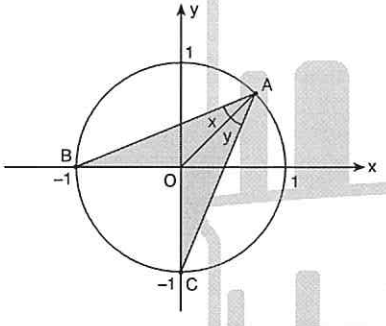


$|OA| = 5$ br $\quad |BC| = 6$ br

⇒ $\tan\alpha - \cot\beta = ?$

A) $\frac{5}{12}$ B) $\frac{1}{2}$ C) $\frac{7}{12}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

3.



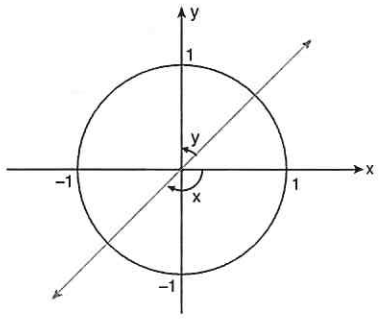
⇒ **A(ABOC) = ?**

A) $\sqrt{2}\sin(x - y)$ B) $\sqrt{2}\sin(x + y)$

C) $\frac{\sqrt{2}}{2}\cos(x + y)$ D) $\frac{\sqrt{2}}{2}\cos(x - y)$

E) 1

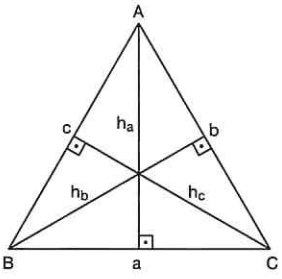
4.



⇒ **cos(π − x) − siny = ?**

A) 2sinx B) sinx C) 0 D) 2cosx E) cosy

5.

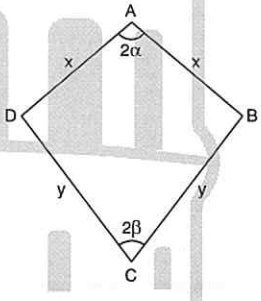


$6h_a = 5h_b = 3h_c$

⇒ **$\cos\hat{A} = ?$**

A) $-\frac{5}{3}$ B) -2 C) -1 D) $-\frac{1}{3}$ E) $-\frac{1}{15}$

6.



$|AB| = |AD| = x$

$|BC| = |CD| = y$

$m(\hat{A}) = 2\alpha$

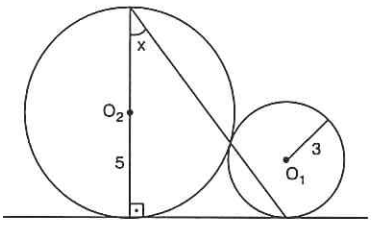
$m(\hat{C}) = 2\beta$

⇒ $\frac{x}{y} = ?$

A) $\frac{\sin\beta}{\sin\alpha}$ B) $\frac{\cos\beta}{\cos\alpha}$ C) $\frac{\sin\alpha}{\sin\beta}$

D) $\frac{\cos\alpha}{\cos\beta}$ E) 1

7.



$r_1 = 3, \quad r_2 = 5$

O_1, O_2 merkez (center)

⇒ **cosx = ?**

A) $\sqrt{10}$ B) $\frac{\sqrt{10}}{2}$ C) $\frac{\sqrt{10}}{4}$

D) $2\sqrt{10}$ E) $\sqrt{5}$

8. $\cos a + \sin b = \sqrt{2}$

$\sin a + \cos b = 1$

⇒ **tan(a + b) = ?**

A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{3}$ C) $\sqrt{2}$ D) $\frac{\sqrt{2}}{2}$ E) 1

9. $2\arcsin(x + 1) = \arccos(x + 2)$

denkleminin bir kökü aşağıdakilerden hangisi olabilir?

Which of the following can be one of the equations's root?

A) $-\frac{1}{2}$ B) $-\frac{3}{2}$ C) -1 D) $\frac{1}{2}$ E) $\frac{3}{2}$

10. $0 < x < 2\pi$

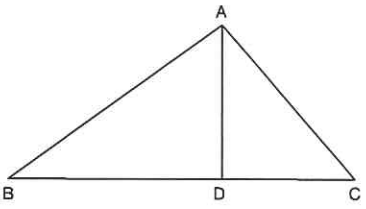
$\cos x \leq \frac{\sqrt{3}}{2}$

⇒ **S. S. = ?**

A) $\left(\frac{\pi}{6}, \frac{5\pi}{6}\right)$ B) $\left[\frac{\pi}{6}, \frac{5\pi}{6}\right]$ C) $\left(\frac{\pi}{6}, \frac{11\pi}{6}\right)$

D) $\left[\frac{\pi}{6}, \frac{11\pi}{6}\right]$ E) $\left[\frac{\pi}{3}, \frac{5\pi}{3}\right]$

11.

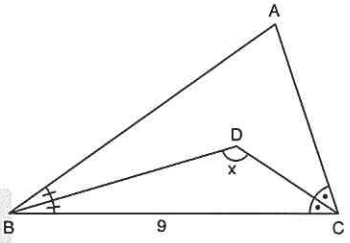


$3|AD| = 3|DC| = |BD|$

⇒ **$\tan(\widehat{BAC}) \cdot \cot(\widehat{ACB}) = ?$**

A) – 2 B) – 3 C) – 4 D) – 5 E) – 6

12.

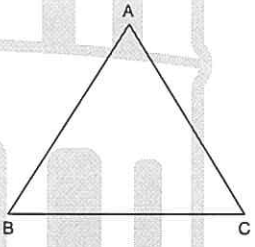


$\sin 2x + 3.\sin\widehat{B} = 0$

⇒ **$|AC| = ?$**

A) 6 B) 5 C) 4 D) 3 E) 2

13.



$3\sin\widehat{A} + 4\cos\widehat{B} = 6$

$4\sin\widehat{B} + 3\cos\widehat{A} = 1$

⇒ **$m(\widehat{C}) = ?$**

A) 15° B) 30° C) 45° D) 60° E) 90°

14. $\sin x = a - b$

$\cos x = a + b$

⇒ **$a^2 + b^2 = ?$**

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) 1

1-A 2-C 3-D 4-C 5-E 6-A 7-C 8-B 9-C 10-D 11-A 12-D 13-B 14-A

TEST 14

1. $A\cos x + B\sin x = \cos 2x$

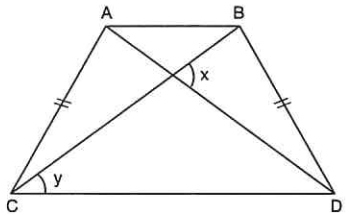
$A\sin x - B\cos x = \sin 2x$

$\Rightarrow$ **A = ?**

A) sinx B) secx C) tanx

D) cotx E) cosx

2.

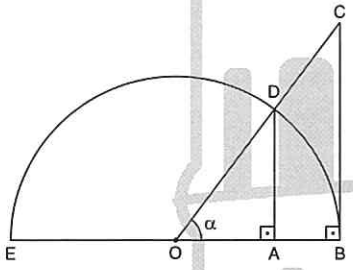


ABCD yamuk (trapezoid)

$\Rightarrow \dfrac{\sin x}{\sin\frac{x}{2} \cdot \cos y} = ?$

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{1}{2}$ E) $\frac{1}{4}$

3.



O merkez (center) $|OE| = 1$ br

$\Rightarrow \dfrac{|BC| + |CD|}{|AB| + |AD|} = ?$

A) cosα B) secα C) sinα

D) cotα E) tanα

4. $f(x) = \sin^2 x - 6\sin x + 15$

$\Rightarrow$ **min(f(x)) = ?**

A) 6 B) 9 C) 10 D) 12 E) 15

5. $\dfrac{\tan 56^\circ \cdot \sin 44^\circ}{\sin 22^\circ \cdot \cos 34^\circ} = ?$

A) 2cot22° B) 2cos56° C) 4sin44°

D) 4cos34° E) 1

6. $x \in [0, 2\pi)$

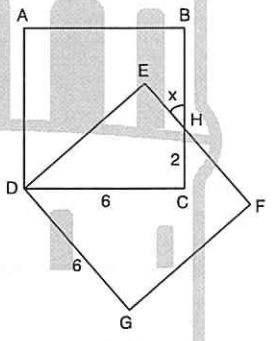
$\cos(5x) = \cos(3x) \cdot \cos(2x)$

S. S. = $\{x_1, x_2, \ldots x_n\}$

$\Rightarrow$ **n = ?**

A) 3 B) 6 C) 8 D) 9 E) 10

7.



ABCD ve DEFG kare

ABCD and DEFG square

$|CH| = 2$

$|DC| = |DG| = 6$

$\Rightarrow$ **tan(x) = ?**

A) $\frac{2}{3}$ B) $\frac{3}{4}$ C) $\frac{4}{5}$ D) $\frac{5}{6}$ E) $\frac{6}{7}$

8. $\cos 2x = 3\sin^4 x$

$\Rightarrow$ **$\cot^2 x = ?$**

A) 2 B) $\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{3}{4}$ E) $\frac{5}{4}$

9. $0 \le \alpha \le \pi$

$$\frac{\sin\alpha}{3 \cdot \cot\alpha} = 1 - \cos\alpha$$

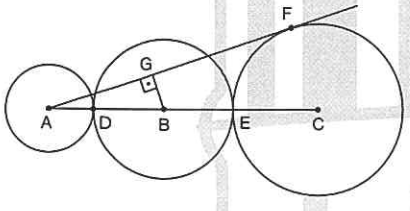
$\Rightarrow$ **$\Sigma\alpha = ?$**

A) 30° B) 45° C) 60° D) 90° E) 120°

10. $\frac{\sin 48^\circ}{\sin 16^\circ} - \frac{\cos 48^\circ}{\cos 16^\circ} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

11.



$|AD| = 1$ br $\quad |DB| = 2$ br

$m(\widehat{ABG}) = \theta \quad \cos\theta = \frac{1}{3}$

$\Rightarrow$ **$|EC| = ?$**

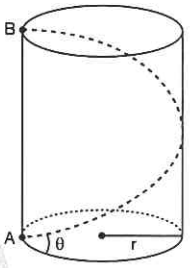
A) 4 B) $\frac{7}{2}$ C) 3 D) $\frac{8}{3}$ E) $\frac{5}{2}$

12. $A = \frac{3\sin^2 x + 2\sin 2x + 6\sin x + 8\cos x}{2 + \sin x}$

$\Rightarrow$ **max(A) = ?**

A) 1 B) 3 C) $\sqrt{5}$ D) 5 E) $\sqrt{7}$

13.



A noktasında bulunan bir karınca şekildeki silindir üzerinden en kısa yoldan B ye gitmiştir.

$r = 5$ br

$|AB| = 24\pi$ br

$\Rightarrow$ **$\tan\theta = ?$**

Ant which is in point A , in the given cylinder went to B with the shortest way , according to the information above what is $\tan\theta$?

A) $\frac{3}{5}$ B) $\frac{25}{24}$ C) $\frac{24}{25}$ D) $\frac{12}{5}$ E) $\frac{5}{12}$

14. $a \neq 0 \quad a \neq 1$

$ax = 1$ ise $x^{\sin x - \cos x} = a^{\cos x}$

denkleminin köklerinden biri aşağıdakilerden hangisidir?

Which of the following can be one of the equation's root?

A) $\frac{\pi}{3}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{6}$ D) $\frac{5\pi}{4}$ E) π

15. $\sin(gof(x)) = \cos(g(f(x)))$

$\Rightarrow$ **$g^{-1}\left(\frac{\pi}{4}\right) = ?$**

A) $\frac{\sqrt{2}}{2}$ B) g(x) C) f(x) D) 2f(x) E) $f^2(x)$

1-E 2-A 3-B 4-C 5-D 6-C 7-B 8-A 9-C 10-C 11-E 12-D 13-D 14-E 15-C

TEST 15

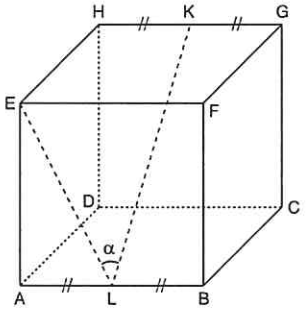
1. $a = \sin^2\left(\text{arc tan}\left(\frac{3}{2}\right)\right) + \cos^2\left(\text{arc tan}\left(\frac{3}{2}\right)\right)$

$b = \tan\left(\text{arc sin}\left(\frac{2}{3}\right)\right) \cdot \cot\left(\text{arc sin}\left(\frac{2}{3}\right)\right)$

$\Rightarrow$ **a + b = ?**

A) 0 B) 1 C) 2 D) 3 E) $\frac{9}{4}$

2.



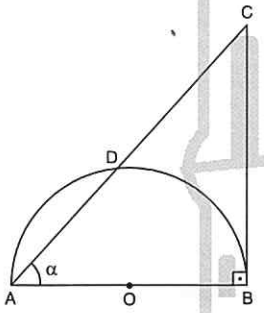
$|AL| = |LB|$, $|HK| = |KG|$

ABCDEFGH bir küp (cube)

$\Rightarrow$ **cosα = ?**

A) $\frac{\sqrt{2}}{2}$ B) $\frac{\sqrt{5}}{5}$ C) $\frac{\sqrt{10}}{10}$ D) $\frac{\sqrt{5}}{10}$ E) $\frac{\sqrt{10}}{5}$

3.



O merkez (O center)

$[AB] \perp [BC]$, $|DC| = 4|AD|$, $m(\widehat{BAD}) = \alpha$

$\Rightarrow$ **cotα = ?**

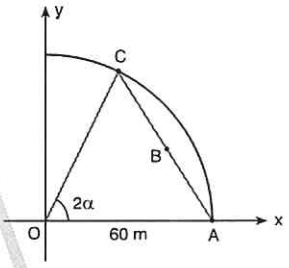
A) $\frac{1}{2}$ B) 1 C) 2 D) $\frac{3}{2}$ E) $\frac{2}{3}$

4. $13x = \frac{3\pi}{2}$

$\Rightarrow$ $\frac{\sin 14x - \cos 11x}{\cos x - \sin 2x} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{\sqrt{3}}{2}$ D) $-\frac{\sqrt{3}}{2}$ E) -1

5.



O merkez

(O center)

$|OC| = |OA| = 60$ m

$m(\widehat{COA}) = 2\alpha$

A noktasında bulunan karınca B üzerinden doğrusal olarak C ye dakikada 3 m hızla p dakikada gitmiştir.

Buna göre, p nin α türünden eşiti nedir?

ant at point A linearly on B went to C in p minutes per 3 meters (3m) .

According to the information above, what is equivalent of p in type of a?

A) 20 sinα B) 20 sin2α C) tan2α D) 40sin2α E) 40 sinα

6. $A = \sqrt{1 + 9\sin^4 x} + \sqrt{49 + 25\cos^4 x}$

$B = \sqrt{16 + 4\sin^4 x}$

$\Rightarrow$ **min(A + B) = ?**

A) -4 B) -1 C) 13 D) 16 E) 25

7. $8 \cdot \left[\sin^4 \frac{\pi}{12} + \cos^4 \frac{\pi}{12}\right] = ?$

A) 5 B) 6 C) 7 D) 8 E) 9

8. $\sin 83° + \cos 83° = \sqrt{m}$

$\Rightarrow$ **$\sin 62° = ?$**

A) $-2m^2$ B) $2m^2 - 4m$ C) $-2m^2 - 4m$

D) $-2m^2 - 4m + 1$ E) $-2m^2 + 4m - 1$

9. $0 < \alpha < \frac{\pi}{2}$ $k \in Z$

$\Rightarrow$ **$\cos\left[\left(k + \frac{1}{2}\right)\pi + (-1)^k\left(\alpha - \frac{\pi}{2}\right)\right] = ?$**

A) $(-1)^k \cdot \sin\alpha$ B) $(-1)^k \cdot \cos\alpha$ C) $-\cos\alpha$

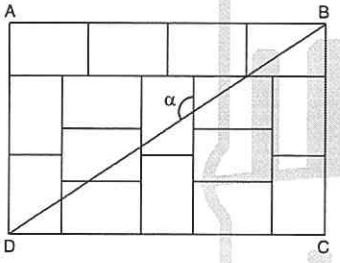
D) $\cos\alpha$ E) $-\sin\alpha$

10. $\frac{\cos 2x}{\sin x + \cos x} = \frac{1}{\sqrt{5}}$

$\Rightarrow$ **$\sin 2x = ?$**

A) $\frac{4}{5}$ B) 1 C) $\frac{6}{5}$ D) $\frac{7}{5}$ E) $-\frac{4}{5}$

11.



ABCD dikdörtgen (rectangle)

Şekil eş dikdörtgenlerden oluşmuştur.

The figure consists of congruent rectangles.

$\Rightarrow$ **$\tan\alpha = ?$**

A) $\frac{3}{2}$ B) $\frac{1}{2}$ C) -1 D) $-\frac{1}{2}$ E) $-\frac{3}{2}$

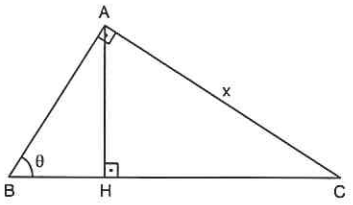
12. $0 < x < \pi$

$$\frac{\sin x \cdot \cos x}{\sin x + \cos x} = \frac{\sin x - \cos x}{2}$$

$\Rightarrow$ **$\sum x = ?$**

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{3\pi}{4}$ E) $\frac{5\pi}{4}$

13.



$|BC| = 2$

$\Rightarrow$ **$|AH| = ?$**

A) 1 B) $\sin 2\theta$ C) $\cos 2\theta$ D) $\cos\theta$ E) -1

14. $\sin x = m$

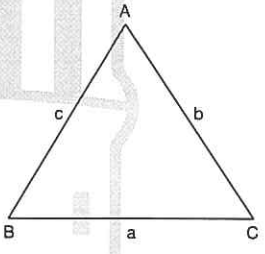
$\sin y = n$

$\Rightarrow$ **$\sin\left(\frac{x-y}{2}\right) \cdot \cos\left(\frac{x+y}{2}\right) = ?$**

A) $\frac{m \cdot n}{2}$ B) $\frac{m+n}{2}$ C) $\frac{m-n}{2}$

D) $m^2 - n^2$ E) $m \cdot n(m-n)$

15.



$\sin\hat{A} - \sin\hat{B} = 5\sin\hat{C}$

$\Rightarrow$ **$\frac{a-b}{a-b-c} = ?$**

A) $\frac{4}{5}$ B) $\frac{5}{4}$ C) $\frac{1}{5}$ D) 5 E) 1

1-C 2-E 3-A 4-E 5-E 6-C 7-C 8-E 9-D 10-A 11-E 12-E 13-B 14-C 15-B

ÜNİTE 6

Unit 6

Karmaşık Sayılar / Complex Numbers

TEST 1

1. $z = x + yi$

$Re(z) = x$

$Im(z) = y$

$4Re(z) + 3Im(z) = -2$

$2Re(z) - Im(z) = 4$

$\Rightarrow$ **z = ?**

A) $1 + i$ B) $1 - i$ C) $2 - i$ D) $1 + 2i$ E) $1 - 2i$

2. $c \in R$

$z = p + qi$

$z^2 + 4z + c = 0$

$\Rightarrow$ **p = ?**

A) 4 B) 2 C) 1 D) -1 E) -2

3. $i = \sqrt{-1}$

$(z - 2)(1 + i) = 1 - i$

$\Rightarrow$ **z = ?**

A) $2 - i$ B) $2 + i$ C) $-i$ D) -2 E) $1 + 2i$

4. $z = 4 + 3i$

$\Rightarrow \dfrac{z + \bar{z}}{z - \bar{z}} = ?$

A) $\dfrac{4}{3}$ B) $\dfrac{4i}{3}$ C) $-\dfrac{4i}{3}$ D) $\dfrac{3i}{4}$ E) $-\dfrac{3i}{4}$

5. $\left(\dfrac{1-i}{1+i}\right)^{140} + \left(\dfrac{1+i}{1-i}\right)^{142} + \left(\dfrac{1-i}{1+i}\right)^{2020} = ?$

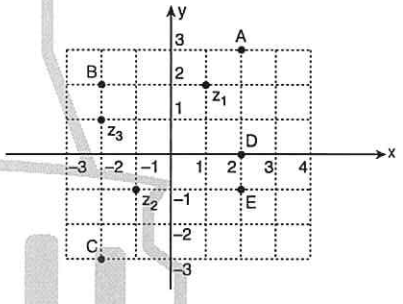
A) -2^{240} B) -1 C) 0 D) 3 E) 1

6. $P(x) = x^2$

$\Rightarrow$ **P(1 + i) = ?**

A) $-2i$ B) $2i$ C) 0 D) -2 E) 2

7.



$z_1(1, 2)$, $z_2(-1, -1)$, $z_3(-2, 1)$

$\Rightarrow$ **$z_1 + z_2 - z_3$ = ?**

A) A B) B C) C D) D E) E

8. $x + 5 + 2yi = 3x - 1 + xi + yi$

$\Rightarrow$ **x . y = ?**

A) 9 B) 3 C) 1 D) -3 E) -9

9. $z_1 \cdot z_2 = (a - b + 2i)(a + b - 2i)$

$\Rightarrow \overline{z}_1 \cdot \overline{z}_2 = ?$

A) $a^2 - b^2 - 4bi - 4$ B) $a^2 + b^2 - 4bi + 4$

C) $a^2 - b^2 + 4bi$ D) $a^2 + b^2 - 4bi - 4$

E) $a^2 - b^2 - 4bi + 4$

10. $z_1 * z_2 = z_1 + z_2 - 3 - 4i$

$x * x^{-1} = e$

$\Rightarrow (2 - 3i)^{-1} = ?$

A) $2 + 3i$ B) $2 - 3i$ C) $4 - i$

D) $4 + i$ E) $4 + 11i$

11. $\dfrac{5 + 6i}{3 - 4i} = ?$

A) $\dfrac{9}{25} + \dfrac{18}{25}i$ B) $-\dfrac{9}{25} + \dfrac{38}{25}i$ C) $2 - i$

D) $2 + i$ E) $\dfrac{9}{25} - \dfrac{38}{25}i$

12. $z = \dfrac{2 - i}{3 + i} + \dfrac{3 - i}{2 + i}$

$\Rightarrow z^{-1} = ?$

A) $1 + i$ B) $\dfrac{3}{2}(1 - i)$ C) $\dfrac{1}{3}(1 + i)$

D) $\dfrac{3}{2}(1 + i)$ E) $1 - i$

13. $z = x + i \cdot y$

$\sqrt{z \cdot \overline{z}} + 3|z| - 7 = 5$

$\Rightarrow |z| = ?$

A) 1 B) 2 C) 3 D) 4 E) 7

14. **Aşağıdakilerden hangisi yanlıştır?**
Which of the following is wrong?

A) $|z_1 \cdot z_2| = |z_1| \cdot |z_2|$

B) $z \cdot \overline{z} = |z|^2$

C) $|\overline{z}_1| - |z_2| \leq |z_1 - z_2|$

D) $|z_1 + z_2| = |z_1| + |z_2|$

E) $|z^n| = |z|^n \ (n \in Z)$

15. $z = \sqrt[3]{\sqrt{7} - 2\sqrt{5}i}$

$\Rightarrow |\overline{z}| = ?$

A) $\sqrt{3}$ B) $3\sqrt{3}$ C) $\sqrt[3]{3}$ D) $\sqrt[3]{9}$ E) $\sqrt[3]{36}$

16. $z = \dfrac{(\sqrt{2} + 6i)^2 \cdot \sqrt{3 - \sqrt{7}i}}{(2i)^4 \cdot (4 + \sqrt{22}i)^2}$

$\Rightarrow |\overline{z}| = ?$

A) $\dfrac{1}{2}$ B) $\dfrac{1}{4}$ C) $\dfrac{1}{6}$ D) $\dfrac{1}{8}$ E) 1

1-E 2-E 3-A 4-C 5-E 6-B 7-D 8-A 9-E 10-E 11-B 12-C 13-C 14-D 15-A 16-D

TEST 2

1. $z = x + i \cdot y$

$|z|^2 + 2|- iz| - |7z| + z \cdot \bar{z} = 12$

$\Rightarrow$ **$x^2 + y^2 = ?$**

A) 20 B) 16 C) 4 D) 2 E) 1

2. $z = x + i \cdot y$

$|z - 2i| = |z + 1|$

$y = ax + b$

$\Rightarrow$ **$y = ?$**

A) $4y = 2x - 3$ B) $4y = 3 - 3x$ C) $4y = 2x - 4$

D) $3y = 3 - 2x$ E) $4y = 3 - 2x$

3. $z_1 = 1 + 4i$

$z_2 = -3 + i$

$\Rightarrow$ **$|z_1 - z_2| = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $|z - 1| = |z + 2i|$

$Re(z) - 4 \cdot Im(z) = -6$

$\Rightarrow$ **$z = ?$**

A) $\frac{2}{3} - 3i$ B) $-3 + \frac{3}{4}i$ C) $-3 + \frac{4}{3}i$

D) $\frac{4}{3} - 2i$ E) $4 + \frac{2}{3}i$

5. $|\sqrt{5}x + 2yi| = |2x - \sqrt{3}yi|$

Denklemi verilen karmaşık sayıların koordinat düzlemindeki gösterimi aşağıdakilerden hangisidir?

Which of the following is the graph on the coordinate plane of the given complex number $|\sqrt{5}x + 2yi| = |2x - \sqrt{3}yi|$?

A) Nokta (point) B) Doğru (line)

C) Çember (circle) D) Elips (Ellipse)

E) Hiperbol (Hyperbole)

6. $z = \frac{1}{2} + \frac{\sqrt{3}}{2}i$

$z = r \cdot cis\theta$

$\Rightarrow$ **$z = ?$**

A) $cis\frac{\pi}{3}$ B) $2cis\frac{\pi}{3}$ C) $cis\frac{4\pi}{3}$

D) $2cis\frac{4\pi}{3}$ E) $cis\frac{5\pi}{3}$

7. $z = |z| \cdot cis\theta$

$\Rightarrow$ $\frac{-z}{\bar{z}} = ?$

A) $|z| \cdot cis(2\theta)$ B) $cis(\theta - \pi)$ C) $cis(2\theta + \pi)$

D) $cis(2\theta - \pi)$ E) $cis(\pi - \theta)$

8. $z_1(3, 210°)$

$z_2(2, 150°)$

$\Rightarrow$ **$z_1 + z_2 = ?$**

A) $\frac{2\sqrt{3}}{3} - i$ B) $\frac{1}{2}(3\sqrt{3} - i)$ C) $\frac{1}{3}(\sqrt{3} + i)$

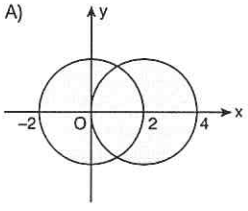
D) $\frac{1}{2}(5\sqrt{3} + i)$ E) $\frac{1}{2}(-5\sqrt{3} - i)$

9. $A = \{Z \in C \mid |z| \leq 2\}$

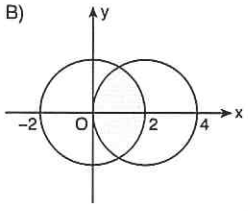
$B = \{Z \in C \mid |z - 2| \leq 2\}$

$\Rightarrow$ **A ∩ B = ?**

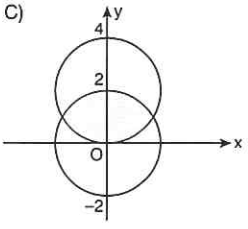
A)



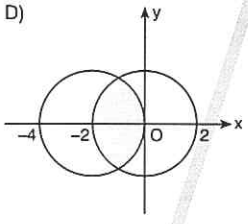
B)



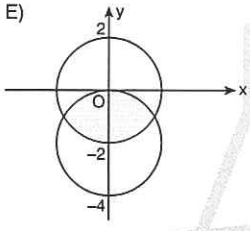
C)



D)



E)



10. $z = x + yi$

$|z - 3 - 4i| = 1$

$|z - 5 - 2i| = 2$

eşitsizliklerini sağlayan z sayılarının birbirine en yakın uzaklığı kaç birimdir?

What is the distance (in units) of nearst z numbers that provide the equalities?

A) $2\sqrt{2} - 1$ B) $2\sqrt{2} - 2$ C) $2\sqrt{2} - 3$

D) $3\sqrt{2} - 1$ E) $3\sqrt{2} - 3$

11. $z = \dfrac{-2 + 2\sqrt{3}\,i}{3\sqrt{3} + 3i}$

$z = r \,.\, cis\theta$

$\Rightarrow$ **z = ?**

A) $2\cos\dfrac{5\pi}{3}$ B) $3\ cis\dfrac{5\pi}{6}$ C) $\dfrac{2}{3}\ cis\dfrac{\pi}{2}$

D) $\dfrac{3}{2}\ cis\dfrac{5\pi}{6}$ E) $\dfrac{2}{3}\ cis\dfrac{5\pi}{6}$

12. $z = -2 + 2\sqrt{3}\,i$

$\Rightarrow$ **z^{1998} = ?**

A) 2^{1998} B) 4^{1998} C) $2^{1998}.\ i$

D) $4^{1998}.\ i$ E) $4^{1998}.\ (1 + i)$

13. $Im(z) > 0$

$z^2 - i \,.\, z + 6 = 0$

$\Rightarrow$ **z^{10} = ?**

A) -3^{10} B) $-3^{10}.\ i$ C) 3^5

D) $-3^5 \,.\, i$ E) $3^{10} \,.\, (1 + i)$

14. $z = 3 + 2i$

$Arg(z) = \theta$

$\Rightarrow$ **$\cos 2\theta$ = ?**

A) $\dfrac{3}{2}$ B) $\dfrac{4}{13}$ C) $\dfrac{5}{13}$ D) $\dfrac{8}{13}$ E) 1

1-B 2-E 3-E 4-B 5-A 6-A 7-C 8-E 9-B 10-C 11-C 12-B 13-A 14-C

TEST 3

1. $x \in C$

$x^2 - 4x + 8 = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{1 - i,\ 1 + i\}$ B) $\{2 - i,\ 2 + i\}$

C) $\{i - 1,\ i + 1\}$ D) $\{2 - 2i,\ 2 + 2i\}$

E) $\{4 - i,\ 4 + i\}$

2. $x, y \in R$

$(y - x) + 8i = 3 + (x + y)i$

$\Rightarrow$ **$x^2 - y^2$ = ?**

A) -24 B) 24 C) 12 D) -12 E) 0

3. $a, b \in R$

$a^2 - 9 + (b + 3)i = (7 + a)i$

$\Rightarrow$ **Σb = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

4. $m \in R$,

$z_1 = m^2 - 6m + 6mi$

$z_2 = m + 3mi$

$\Rightarrow$ **$\min(z_1 + 2\overline{z_2})$ = ?**

A) -9 B) -4 C) 0 D) 4 E) 9

5. $z_1 = (1 - i)^{20} + (1 + i)^{20}$

$z_2 = (1 - i)^{20} \cdot (1 + i)^{20}$

$\Rightarrow$ **$z_1 \cdot z_2$ = ?**

A) 0 B) 1 C) 2^9 D) 2^{31} E) -2^{31}

6. $i^2 = -i$

$\Rightarrow \dfrac{i + i^2 + i^3 + \ldots + i^{2020}}{(200i)^{-5} + (-5i)^{200}} = ?$

A) 0 B) i C) 200i D) 5^{200} E) 2020

7. $|z| \leq 3$

$|z - 5 - 12i| = r$

$\Rightarrow$ **min(r) = ?**

A) -13 B) -10 C) 10 D) 13 E) 16

8. $|z_1 - 6 - 3i| = 3$

$|z_2 - 3 + i| = 1$

$\Rightarrow$ **$\max|z_1 - z_2|$ = ?**

A) 8 B) 9 C) 10 D) 11 E) 12

9. $x, y \in R$,

$z_1 = (x - yi)^2 + (y + xi)^2$

$z_2 = (1 - i)^5 + (1 + i)^5$

$\Rightarrow z_1 - z_2 = ?$

A) 8 B) 4i C) 0 D) – 4i E) – 8

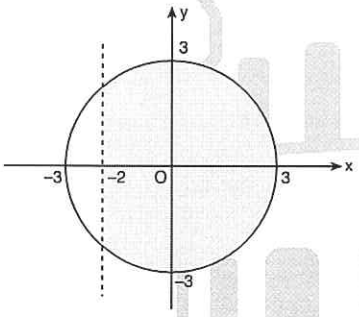
10. $z = x + yi$

$Arg(z) = 80°$

$\Rightarrow Arg(z + |z|) = ?$

A) 160° B) 80° C) 40° D) 20° E) 10°

11.



Şekildeki karmaşık sayılar hangi denklem sisteminin çözüm kümesidir?

Which of the following is a solution set of complex numbers shown on the figure?

A) $|z| < 3$ $Re(z) \leq -2$

B) $|z| \leq 3$ $Re(z) \leq -2$

C) $|z| \leq 3$ $Re(z) \geq -2$

D) $|z| \leq 3$ $Re(z) > -2$

E) $|z| \leq 3$ $Im(z) > -2$

12. $P(x) = 1 - x + x^2 - x^3 \ldots + x^{58} - x^{59} + x^{60}$

$\Rightarrow P(i) = ?$

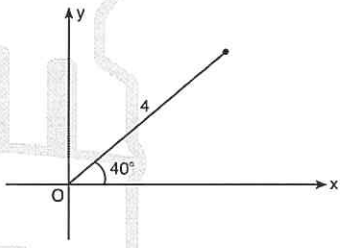
A) 60i B) 60 C) i^2 D) i E) 1

13. $n \in N$

$\Rightarrow i^{4n+3} + i^{20n-3} \cdot i^{-64n+1} = ?$

A) 1 + i B) 0 C) – 1 – i D) i E) – 1

14.



$z = r \cdot cis\theta$

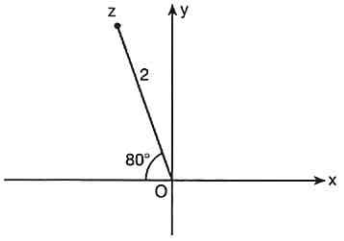
$\Rightarrow \sqrt{z} = ?$

A) 4 cis40° B) 2 cis20° C) 4 cis20°

D) 2 cis40° E) 2

1-D 2-A 3-C 4-B 5-E 6-A 7-C 8-B 9-A 10-C 11-D 12-E 13-C 14-B

1.



$z = (r, \theta)$

⇒ $z^3 = ?$

A) (2, 240°) B) (8, 240°) C) (8, 200°)

D) (8, 80°) E) (8, 300°)

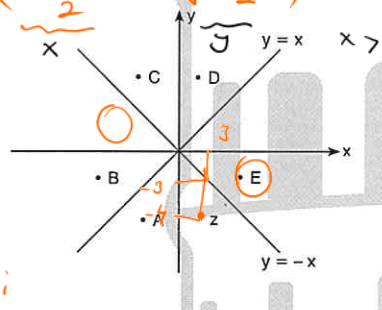
2. $z = x + yi$

$z = (r, \theta) = \left(1, \frac{5\pi}{3}\right)$

⇒ $y = ?$

A) $-\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{1}{2}$ D) $-\frac{1}{2}$ E) $\sqrt{3}$

3.



$z = x + yi$ karmaşık sayısının karekköklerinden biri nedir?

Which of the following is one of the square roots of z complex number?

A) A B) B C) C D) D E) E

4. $z = x + yi$

$f(x + yi) = x + yi$

$f(z) = \frac{z - 13}{z - 3}$

⇒ **z aşağıdakilerden hangisi olabilir?**

Which of the following can be the value of z?

A) 1 + i B) 2 + i C) 2 + 2i

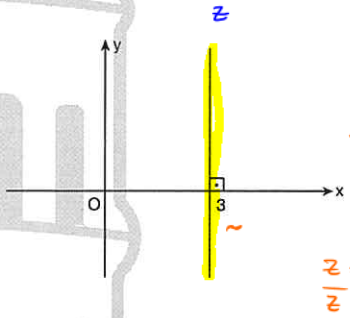
D) 3 + 2i E) 2 + 3i

5. $i^2 = -1$

⇒ $(1 - i) \cdot (1 + i^{13}) \cdot (1 + i^{23}) \cdot (1 + i^{21}) = ?$

A) 4i B) 4 C) 2 D) 2i E) 1

6.



$z \in C$

Şekilde verilen karmaşık sayılar aşağıda verilen denklemlerden hangisinin çözüm kümesidir?

Which of the following is a solution set of complex numbers shown on the figure?

A) $z - \bar{z} = 1$ B) $\bar{z} = 3$ C) $z + \bar{z} = 6$

D) $|z| = 3$ E) $z + \bar{z} = 3$

7. $z \in C$

$\text{Arg}(z) = \frac{\pi}{5}$

$\Rightarrow$ **Arg($\bar{z}$) = ?**

A) $\frac{4\pi}{5}$ B) $\frac{7\pi}{5}$ C) $\frac{8\pi}{5}$ D) $\frac{9\pi}{5}$ E) $\frac{13\pi}{5}$

8. $z = \cos\theta - i \cdot \sin\theta$

$\Rightarrow$ **$-z$ = ?**

A) $\text{cis}(\pi + \theta)$ B) $\text{cis}(-\theta)$ C) $\text{cis}(\theta)$

D) $\text{cis}(\pi - \theta)$ E) $\text{cis}(\theta - \pi)$

9. $z = \frac{2-i}{1+2i}$

$\Rightarrow$ **z^{1997} = ?**

A) i B) $-i$ C) 0 D) $1+i$ E) $1-i$

10. $z = \sin 50° + (1 + \cos 50°)i$

$\Rightarrow$ **Arg(z) = ?**

A) 25° B) 30° C) 60° D) 65° E) 75°

11. $|z| + z = 18 + 12i$

$\Rightarrow$ **z = ?**

A) $3 + 4i$ B) $3 + 12i$ C) $5 + 12i$

D) $5 - 12i$ E) $2 + 12i$

12. $i^2 = -1$

$z^2 = 3 + 5i$

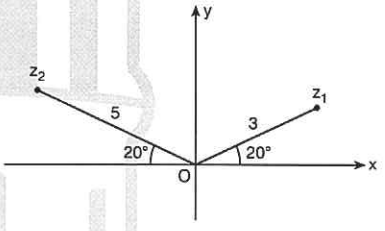
S. S. = {p, q}

$\Rightarrow$ **$p^3 + q^3$ = ?**

A) $3 + 5i$ B) 34 C) $5 + 3i$

D) 8 E) 0

13.



$\Rightarrow$ **$z_1 \cdot z_2$ = ?**

A) -15 B) 15 C) $15i$ D) $-15i$ E) $5i$

1-E 2-A 3-E 4-E 5-B 6-C 7-D 8-D 9-B 10-D 11-C 12-E 13-A

1. $z = \frac{1+i}{\sqrt{2}}$

$\Rightarrow z^2 + z^4 + z^6 + \ldots + z^{200} = ?$

A) 0 B) 1 C) i D) 2i E) 200i

2. $z = x + yi$

$|z + 3 - 2i| = 3$

karmaşık sayılarının geometrik yer denklemi aşağıdakilerden hangisidir?

Which of the following is the geometrical equation of complex numbers?

A) $(x+3) + (y+2)^2 = 9$ B) $(x-3)^2 + (y+2)^2 = 9$

C) $(x+3)^2 + (y-2)^2 = 9$ D) $(x+3)^2 + (y-2)^2 = 3$

E) $(x-2) + (y+3)^2 = 3$

$z = -\left(\sqrt{\frac{|z|+a}{2}} + \sqrt{\frac{|z|-a}{2}}\right)^2$

3. $z = -5 + 4i$

karmaşık sayılarının karekökleri w_0 ve w_1 dir.

Buna göre, $w_0 \cdot w_1$ aşağıdakilerden hangisidir?

$z = -5 + 4i$ the square roots of complex numbers are w_0 and w_1.

According to the given information which one of the following is $w_0 \cdot w_1$?

A) $-5 + 4i$ B) $-5 - 4i$ C) $5 + 4i$

D) $5 - 4i$ E) $4 - 5i$

4. $x > y$

$\Rightarrow \sqrt{x-y} \cdot \sqrt{y-x} = ?$

A) $x + yi$ B) $xi - yi$ C) $x - yi$

D) $x - y$ E) $y - x$

5. $x^2 - 4x + 13 = 0$

S. S. $= \{z_1, z_2\}$

$z_1, z_2 \in C$

I. $|z_1| = |z_2|$

II. $Arg(z_1) = Arg(z_2)$

III. $Arg(z_1 + z_2) = 0$

ifadelerinden hangileri doğrudur?

Which of the expressions above are true?

A) I ve II B) I ve III C) II ve III

D) Yalnız II E) I, II ve III

6. $|z| = 2\sqrt{5}$

$Arg(z-2) = \frac{\pi}{4}$

$\Rightarrow z = ?$

A) $2 + 4i$ B) $2i$ C) $-2 - 4i$

D) $2 - 4i$ E) $4 + 2i$

7. $f(z) = z^2 + i \cdot z + z_1$

$f(1 + i) = 0$

$\Rightarrow |z_1| = ?$

A) $\sqrt{2}$ B) $\sqrt{5}$ C) $\sqrt{7}$ D) $\sqrt{10}$ E) 5

8. $i^2 = -1$

$z = a + bi$

$Arg(z) + Arg(z^2) + Arg(z^3) = 3\pi$

$\Rightarrow$ **a = ?**

A) 3i B) i C) − 3i D) − i E) 0

9. $z = \sin60° - i \cdot cis60°$

$z = r \cdot cis\theta$

$\Rightarrow$ **z = ?**

A) $cis\frac{\pi}{6}$ B) $cis\frac{5\pi}{6}$ C) $cis\frac{7\pi}{6}$

D) $cis\frac{9\pi}{6}$ E) $cis\frac{11\pi}{6}$

10. $z = \frac{1+i}{1-i} + \frac{1-i}{1+i}$

$\Rightarrow |z| = ?$

A) 0 B) 2 C) 4 D) 6 E) 8

11. $z, u \in C$

$z \neq 0 \quad u \neq 0$

$z \cdot \overline{u} = 4 \cdot u$

$\Rightarrow z \cdot \overline{z} = ?$

A) 4 B) 8 C) 16 D) 20 E) 24

12. $z = 4(\cos60° + i.\sin60°)$

$\overline{z}$ karmaşık sayısının kareköklerinden biri nedir?

Which of the following is one of the square roots of $\overline{z}$ complex numbers?

A) 4.cis15° B) 2.cis30° C) 2.cis150°

D) 4.cis330° E) 2.cis300°

13. $z = 64(\cos150° + i.\sin150°)$

karmaşık sayısının küp kareköklerinden biri aşağıdakilerden hangisidir?

Which of the following is one of the cube roots of the cube roots of $z = 64(\cos150° + i.\sin150°)$ complex numbers?

A) 64.cis50° B) 4.cis170° C) 4.cis190°

D) 64.cis290° E) 2.cis290°

14. $z^2 = 7 + 24i$

denkleminin kökleri oranı nedir?

What is the ratio of the roots of $z^2 = 7 + 24i$ equation?

A) $\frac{7}{24}$ B) − 1 C) 1 D) $\frac{24}{7}+$ E) 25

1-A 2-C 3-D 4-B 5-B 6-E 7-D 8-E 9-E 10-A 11-C 12-C 13-B 14-B

TEST 6

1. $\text{Arg}(z_1 \cdot z_2) = \frac{\pi}{3}$

$\text{Arg}\left(\frac{z_1}{z_2}\right) = \frac{\pi}{6}$

⇒ **Arg(z_1) = ?**

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{5}$ E) $\frac{\pi}{6}$

2. $z = \frac{5i}{4 + 4\sqrt{3}i}$

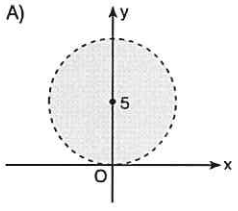
⇒ **Arg(z)?**

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{5}$ E) $\frac{\pi}{6}$

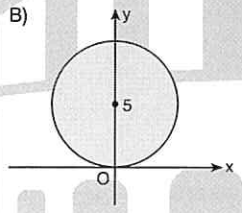
3. $|z - 5i| < 5$

koşulunu sağlayan z karmaşık sayılarının koordinat düzleminde gösterimi aşağıdakilerden hangisidir?
Which of the following is the graph on the coordinate plane of the complex numbers "z" which meets $|z - 5i| < 5$?

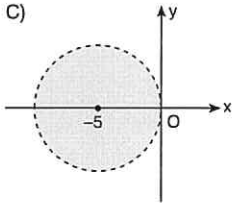
A)



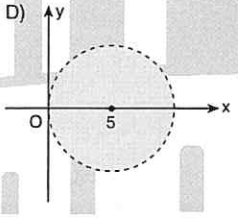
B)



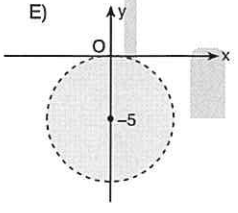
C)



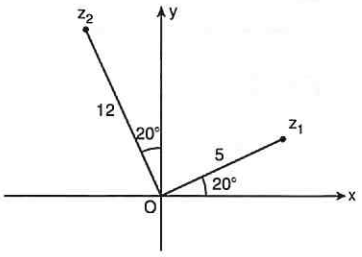
D)



E)



4.



⇒ **$|z_1 + z_2|$ = ?**

A) 17 B) 13 C) 10 D) 5 E) 1

5. $z = 4 + i$

⇒ $\left(\frac{z + \bar{z}}{z - \bar{z}}\right)^{20}$ = ?

A) 2^{10} B) 2^{20} C) 2^{30} D) 2^{40} E) 4^{40}

6. $z = 1 + \sqrt{3}i$

⇒ $(\bar{z})^{60}$ = ?

A) $2^{60}(1 + i)$ B) $2^{60} \cdot i$ C) $-2^{60} \cdot i$
D) $-i$ E) 2^{60}

7. ⇒ $\frac{(8 - 4i) \cdot (6 + 3i)}{(1 - i) \cdot (1 + i)}$ = ?

A) 30 B) 15 C) 10 D) 5 E) 1

8. $m \in R$

$\Rightarrow \dfrac{1 - mi}{i} = m - i = ?$

A) 8 B) 4 C) 2 D) 1 E) 0

9. $\Rightarrow \dfrac{(1 - i^2) \cdot (1 - i^6) \cdot (1 - i^{10}) \cdot \ldots \cdot (1 - i^{78})}{(1 - i) \cdot (1 - i^3) \cdot (1 - i^5) \cdot \ldots \cdot (1 - i^{39})} = ?$

A) 2^{78} B) $2^{39}i$ C) $2^{20}i$ D) 2^{10} E) 1

10. $(\cos\alpha + i.\sin\alpha)^2 = \cos^2\alpha + i.\sin^2\alpha$

olduğuna göre, α aşağıdakilerden hangisi olabilir?

According to the given information which of the following can be α?

A) 15° B) 30° C) 45° D) 60° E) 180°

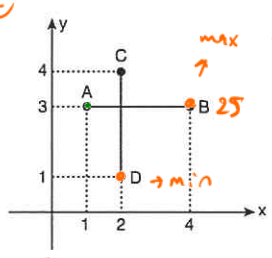
11. $z = x + yi$

$z^3 = -1$

$\Rightarrow (z - 1)^{10} = ?$

A) 0 B) z C) z − 1 D) z + 1 E) − z

12.



$z \in [AB]$

$z \in [CD]$

$w = z \cdot \bar{z}$

$\Rightarrow$ **max(w) + min(w) = ?**

A) 20 B) 25 C) 30 D) 35 E) $5 + \sqrt{5}$

13. $z = x + yi$

$4z - 3\bar{z} = \dfrac{1 - 18i}{2 - i}$

$\Rightarrow \bar{z} = ?$

A) 4 − i B) 4 + i C) 3 + i D) 3 − i E) 5 + i

14. $\bar{z} = \dfrac{|z|^2 + z}{z + i}$

$\Rightarrow z = ?$

A) $\{c + ci \mid c \in R, c \neq 0\}$

B) $\{c - ci \mid c \in R, c \neq 0\}$

C) $\{2c - ci \mid c \in R, c \neq 0\}$

D) $\{2c + ci \mid c \in R, c \neq 0\}$

E) $\{c + 2ci \mid c \in R, c \neq 0\}$

1-C 2-E 3-A 4-B 5-D 6-E 7-A 8-E 9-D 10-E 11-C 12-C 13-B 14-A

TEST 7

1. $z = x + yi$

$\frac{1}{z} = \text{cis}\,\frac{\pi}{4}$

$\Rightarrow$ **z = ?**

A) $\frac{\sqrt{2}}{2}(1 - i)$ B) $\frac{\sqrt{2}}{2}(1 + i)$ C) $1 + i$

D) $1 - i$ E) $\sqrt{2}(1 + i)$

2. $z = a + bi$

$|z - 1| = 2$

$|z - i| = 3$

$\Rightarrow$ **Re(z) – Im(z) = ?**

A) $\frac{7}{3}$ B) 5,5 C) 4,5 D) 3,5 E) 2,5

3. $z = x + yi$

$(|z| - \overline{z}) \cdot (|z| + z) = i$

$|z - i| = 3$

$\Rightarrow$ **y = ?**

A) $\frac{1}{|z|}$ B) $|z|$ C) $\frac{1}{2|z|}$ D) $2|z|$ E) 1

4. $z = x + yi \quad z \neq 0$

$z^2 = \overline{z}$

$\frac{\pi}{2} < \text{Arg}(z) < \pi$

$\Rightarrow$ **z = ?**

A) $\frac{1}{2} + \frac{1}{2}i$ B) $\frac{1}{2} - \frac{1}{2}i$ C) $\frac{1}{2} + \frac{\sqrt{3}}{2}i$

D) $\frac{1}{2} - \frac{\sqrt{3}}{2}i$ E) $-\frac{1}{2} + \frac{\sqrt{3}}{2}i$

5. $z = \frac{\cos 85° + i.\sin 85°}{\cos 25° + i.\sin 25°}$

$\Rightarrow$ **z = ?**

A) $\frac{\sqrt{3} + i}{2}$ B) $\frac{\sqrt{3} - i}{2}$ C) 1

D) $\frac{1 + i\sqrt{3}}{2}$ E) $\frac{1 - i\sqrt{3}}{2}$

6. $z \in C$

$z - (i + 3) = 3$

$\text{Arg}(z) = \theta$

$\Rightarrow$ **cotθ = ?**

A) 6 B) $\frac{1}{6}$ C) 3 D) $\frac{1}{3}$ E) 1

7. $z = C$

$z.|Re(z)| = 4 + 3i$

$\Rightarrow |-i \cdot \bar{z}| = ?$

A) $\frac{3}{2}$ B) $\frac{5}{2}$ C) $\frac{7}{2}$ D) $\frac{9}{2}$ E) 5

8. $f: C \to C$

$f(z) = 4 - 2z^6$

$z_0 = \cos\frac{\pi}{3} + \sin\frac{\pi}{3}$

$\Rightarrow f(z_0) = ?$

A) 1 B) 2 C) i D) 2i E) 1 + 2i

9. $f: C \to C$

$f(z) = \sum_{k=1}^{201} z^k$

$\Rightarrow f(i) = ?$

A) 1 + i B) – 1 C) i D) – i E) 0

10. $P(x) = x^4 + ax^3 + bx^2 + cx + d$

$P(-i) = P(2i) = 0$

$\Rightarrow P(0) = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

11. $z^2 = i$

S. S. $= \{z_1, z_2\}$

$\Rightarrow |z_1 - z_2| = ?$

A) 4 B) 3 C) 2 D) $\sqrt{2}$ E) 1

12. $z_1, z_2 \in C$

$z_1 \bigstar z_2 = z_1 + z_2 + |z_1 \cdot z_2|$

$\Rightarrow (2 + i) \bigstar (1 - 2i) = ?$

A) 4 + i B) 8 – i C) 4 – i D) 8 + i E) 0

13. $i^2 = -1$

$z = \frac{1 + xi}{1 - xi}$

$\Rightarrow |z^{-1}| = ?$

A) xi B) i C) – i D) 1 E) – 1

14. $z = a + (a + 1)i$

$|z + iz| = \sqrt{2}$

$\Rightarrow \Sigma a = ?$

A) 0 B) – 1 C) – 2 D) – 3 E) – 4

1-A 2-E 3-C 4-E 5-D 6-A 7-B 8-B 9-C 10-A 11-C 12-B 13-D 14-B

1. $s = \sin x$

$c = \cos x$

$\Rightarrow$ **$c^4 + 2s^2 . c^2 + s^4 - 2 = ?$**

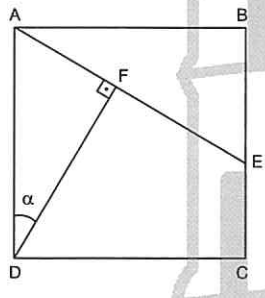
A) 0 B) 1 C) – 1 D) – sinx E) cosx

2. $$\frac{\sin1° . \sin2° . \sin3° . \ldots . \sin a°}{\cos1° . \cos2° . \cos3° . \ldots . \cos89°} = 1$$

$\Rightarrow$ **a = ?**

A) 88 B) 89 C) 90 D) 45 E) 60

3.



ABCD kare (square)

$|EC| = 3|BE|$

$\Rightarrow$ **$\cot\alpha = ?$**

A) 4 B) 3 C) 2 D) $\frac{1}{2}$ E) $\frac{1}{4}$

4. $$A = \frac{|\sin\alpha - 2| + |\cos\alpha - 3|}{-|\sin\alpha - 3| - |2 - \cos\alpha|}$$

$\Rightarrow$ **A = ?**

A) $\cot\alpha$ B) $\tan\alpha$ C) 1 D) 0 E) – 1

5. Her x gerçel sayısı için $(\forall x \in R)$

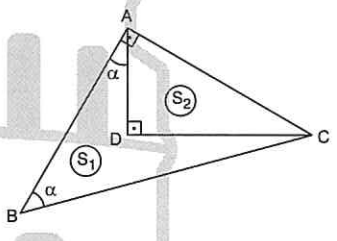
$K = \cos4x + \cos6x + \cos8x$

$\Rightarrow$ **$\sum_{k=2}^{4} \cos^2(kx) = ?$**

A) K + 4 B) K + 1 C) K

D) $\frac{K+2}{2}$ E) $\frac{K+3}{3}$

6.



$A(ABCD) = S_1$

$A(ADC) = S_2$

$m(\widehat{ABC}) = m(\widehat{DAB}) = \alpha$

$\Rightarrow$ **$\frac{S_1}{S_2} = ?$**

A) $\cos2\alpha$ B) $\cot2\alpha$ C) $\sin2\alpha$

D) $\cot^2\alpha$ E) $\tan^2\alpha$

7. $0 < x < \frac{\pi}{2}$

$\text{cosec}x = 3$

$\Rightarrow$ **secx . tanx . (1 – sinx) = ?**

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) 3 E) 4

8. $i^2 = -1$

$P(x) = 1 + x$

$\Rightarrow$ **$P(i) \cdot P(i^3) \cdot P(i^5) \cdot P(i^7) = ?$**

A) 5 B) 4 C) 0 D) $2i^2$ E) $4i^2$

9. $i^2 = -1$

$\Rightarrow$ **$\sqrt{-2} \cdot \sqrt{-8} = ?$**

A) 4 B) 4i C) – 4 D) – 4i E) – 2

10. $n \in Z^+$

$i^2 = -1$

$\Rightarrow \frac{i^{-38} + i^{-79} + i^{-117}}{i^{83} + i^{16n+1} + i^{4n+2}} = ?$

A) 1 B) i C) i^2 D) i^3 E) 0

11. $i^2 = -1$

$P(x) = i^{2!} + i^{3!} + i^{4!} + i^{5!} + \ldots + i^{90!}$

$\Rightarrow$ **P(90!) = ?**

A) 82 B) 83 C) 84 D) 85 E) 89

12. $i^2 = -1$

$x^2 + (2 + 2i)x + 2i = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{1, -1\}$ B) $\{i, -i\}$ C) $\{1 + i, 1 - i\}$
D) $\{1 + i\}$ E) $\{-1 - i\}$

13. $i = \sqrt{-1}$

$m < 0 < n$

$n \cdot i + 1 = n + n\sqrt{m}$

$\Rightarrow$ **m . n = ?**

A) – 2 B) – 1 C) 1 D) – 6 E) – 8

14. $z_1 = \left(\frac{3 + 7i}{7 - 3i}\right)^{2075}$

$z_2 = \frac{1}{i} + \frac{1}{i^2} + \frac{1}{i^3} + \frac{1}{i^4}$

$\Rightarrow$ **$z_1 + z_2 = ?$**

A) – i B) i^2 C) i D) 1 E) 0

1-C 2-B 3-A 4-E 5-E 6-D 7-C 8-B 9-C 10-A 11-D 12-E 13-B 14-A

TEST 2

1. $(1 + \tan20°) \cdot (1 + \tan25°) = ?$

A) – 2 B) – 1 C) 0 D) 1 E) 2

2. $\tan(x + 45°) = 3$

$\Rightarrow$ **tanx = ?**

A) 2 B) 3 C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

3. $\sin\alpha \cdot \cos\alpha = \frac{1}{4}$

$\Rightarrow$ **$\sin^6\alpha + \cos^6\alpha$ = ?**

A) $\frac{2}{9}$ B) $\frac{3}{4}$ C) $\frac{11}{16}$ D) $\frac{13}{16}$ E) $\frac{15}{16}$

4. $\tan\alpha = \cos\alpha$

$\Rightarrow$ **$\sin\alpha$ = ?**

A) $\frac{1-\sqrt{5}}{2}$ B) $\frac{\sqrt{5}-1}{2}$ C) $\frac{1-\sqrt{5}}{4}$ D) $\frac{\sqrt{5}+1}{4}$ E) $\frac{1+\sqrt{5}}{4}$

5. $24x = \pi$

$\Rightarrow$ $2 \cdot \frac{\cos6x + \cos14x}{\sin8x} = ?$

A) sec2x B) cosec2x C) 2 D) sin2x E) cot2x

6. $b < 0 < a$

$i = \sqrt{-1}$

$\sqrt{b-a} + \sqrt{b^2} = 4 + 4i$

$\Rightarrow$ **a + b = ?**

A) – 8 B) – 4 C) 2 D) 8 E) 16

7. $z = 2 + yi$

$\arg(\sqrt{z^3}) - \arg(3z) = 30°$

$\Rightarrow$ **y^2 = ?**

A) 4 B) 8 C) 12 D) 16 E) 24

8. $i^2 = -i$

$2zi = \sqrt{3-\sqrt{7}}\,i$

$\Rightarrow$ **$|z|$ = ?**

A) 4 B) 3 C) 2 D) 1 E) $\frac{1}{2}$

9. $z = \dfrac{1-\sqrt{3}-\sqrt{5}\,.\,i}{\sqrt{3}-1-\sqrt{5}\,.\,i}$

$\Rightarrow$ **$z\,.\,\bar{z} = ?$**

A) $\sqrt{5}$ B) $\sqrt{3}$ C) 3 D) 2 E) 1

10. $z = \sin\alpha + i\,.\,\cos\alpha$

$\Rightarrow$ **arg(z) = ?**

A) $\dfrac{\pi}{2}+\alpha$ B) $\dfrac{\pi}{2}-\alpha$ C) $\dfrac{3\pi}{2}+\alpha$

D) $\dfrac{3\pi}{2}-\alpha$ E) $2\pi+\alpha$

11. $z = 6 - a + (3-2a)i$

$\arg z = \dfrac{3\pi}{4}$

$\Rightarrow$ **a = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $z = 2(\cos30° + i\,.\,\sin60°)$

$\Rightarrow$ **$\arg(\sqrt[3]{z^2}) = ?$**

A) 15° B) 25° C) 30° D) 45° E) 60°

13. $z = 4i - 3$

$\arg(z) = \alpha$

$\Rightarrow$ **$\sin2\alpha = ?$**

A) $-\dfrac{3}{5}$ B) $-\dfrac{4}{5}$ C) -1 D) $\dfrac{12}{25}$ E) $-\dfrac{24}{25}$

14. $z = i^3\,.\,(\cos11° + i\,.\,\sin11°)$

$\Rightarrow$ **arg(z) = ?**

A) 191° B) 281° C) 101°

D) 371° E) 11°

1-E 2-C 3-D 4-B 5-A 6-D 7-C 8-D 9-E 10-B 11-C 12-C 13-E 14-B

TEST 3

1. $i^2 = -1$

$z = a + bi$

$\Rightarrow \dfrac{z^2+1}{z-i} - \dfrac{z^2+9}{z+3i} = ?$

A) $-4i$ B) $-2i$ C) $-i$ D) $2i$ E) $4i$

2. $i^2 = -1$

$z_1 = 5 + 3i$

$z_2 = (a+2) + bi$

$z_1 = \overline{z_2}$

$\Rightarrow$ **a . b = ?**

A) -9 B) -6 C) -3 D) 3 E) 6

3. $z_1 = \cos50° + i.\sin50°$

$z_2 = 2(\cos20° + i.\sin20°)$

$\Rightarrow$ **$z_1^2 . z_2^4$ = ?**

A) $16i$ B) $-16i$ C) -16 D) 4 E) $-4i$

4. $z^2 - 2z + 2 = 0$

$\Rightarrow$ **S . S. = ?**

A) $\{0, i\}$ B) $\{1+i, 1-i\}$ C) $\{i, -i\}$ D) $\{2i, -2i\}$ E) $\varnothing$

5. $\sqrt{1+\sqrt{3}}\,i = z$

$\Rightarrow$ **S . S. = ?**

A) $\{\sqrt{3}+i, -\sqrt{3}-i\}$

B) $\left\{\dfrac{\sqrt{3}}{2}+\dfrac{i}{2}, -\dfrac{\sqrt{3}}{2}-\dfrac{i}{2}\right\}$

C) $\{\sqrt{3}+i, \sqrt{3}-i\}$

D) $\left\{\dfrac{\sqrt{6}}{2}+\dfrac{\sqrt{2}}{2}i, -\dfrac{\sqrt{6}}{2}-\dfrac{\sqrt{2}}{2}i\right\}$

E) $\left\{\dfrac{\sqrt{6}}{2}+\dfrac{\sqrt{2}}{2}i, \dfrac{\sqrt{6}}{2}-\dfrac{\sqrt{2}}{2}i\right\}$

6. $z = 2\,\text{cis}80°$

$w = 4\,\text{cis}20°$

$\Rightarrow |z - w| = ?$

A) 12 B) $12\sqrt{3}$ C) 4 D) 2 E) $2\sqrt{3}$

7. $i^2 = -1$

$f(x) = x^3 - 3x^2 + 3x + 1$

$\Rightarrow$ **f(1 + i) = ?**

A) $(1+i)^3$ B) $2+i$ C) $2-i$ D) $2i$ E) $(2+i)^3$

8. $a, b, c \in N$

$a \neq b \neq c$

$i^2 = -1$

$i^a + i^b + i^c + 3i = 0$

$\Rightarrow$ **min(a + b + c) = ?**

A) 20 B) 21 C) 22 D) 23 E) 24

9. $\sec(\text{arc}\tan 7) = a\sqrt{b}$

$\Rightarrow$ **max(a + b) = ?**

A) 3 B) 5 C) 7 D) 51 E) 58

10. $\sin^4 15° + \cos^4 15° = ?$

A) $\frac{1}{2}$ B) $\frac{2}{3}$ C) $\frac{3}{4}$ D) $\frac{6}{7}$ E) $\frac{7}{8}$

11. $f(a, b) = a^6 + a^4 + 5a^2b^2 + b^4 + b^6$

$\Rightarrow$ **f(cosα, sinα) = ?**

A) 8 B) 6 C) 4 D) 2 E) 1

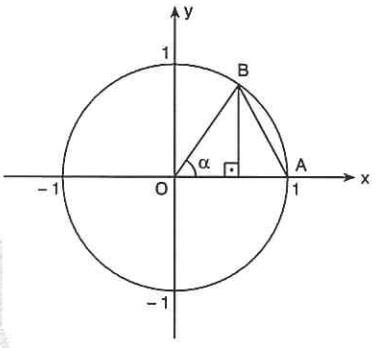
12. $2x^2 - x + c = 0$

$S.S. = \{\sin\alpha, \cos\alpha\}$

$\Rightarrow$ **c = ?**

A) $-\frac{3}{4}$ B) $-\frac{3}{8}$ C) $\frac{1}{4}$ D) $\frac{3}{4}$ E) $\frac{3}{8}$

13.



$m(\widehat{BOA}) = \alpha$

$|AB| = \cos\alpha$

$\Rightarrow$ **1 + cosα = ?**

A) $\sqrt{2}$ B) $\sqrt{3}$ C) 1 D) $\sqrt{3} - 1$ E) $2\sqrt{3}$

14. $a \in Z,$

$\frac{a - 3\cos x}{a + \cos x} = 2$

$\Rightarrow$ $\sum a = ?$

A) − 22 B) − 11 C) 0 D) 11 E) 22

1-E 2-A 3-C 4-B 5-D 6-E 7-C 8-B 9-D 10-E 11-D 12-A 13-B 14-C

ÜNİTE 7

Unit 7

Logaritma / Logarithm

1. $3^x = 5$

$\Rightarrow$ **x = ?**

A) $\log_3 5$ B) $\log_5 3$ C) log5 D) log3 E) 1

2. $\log_3 x = 2$

$\Rightarrow$ **x = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

3. $\log_5 [2 + \log_2 (x - 3)] = 1$

$\Rightarrow$ **x = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

4. $\log_5 \sqrt{5} + \log_7 \frac{1}{7} + \log 100 = ?$

A) $\frac{7}{2}$ B) 3 C) $\frac{5}{2}$ D) $\frac{4}{3}$ E) $\frac{3}{2}$

5. $\frac{\ln e + \log 10}{\log_{13} 13 + \log_{17} 1} = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

6. $x > 0, \quad x \neq 1$

$\log_x 15 + \log_x 6 - \log_x 10 = 2$

$\Rightarrow$ **x = ?**

A) 15 B) 10 C) 9 D) 4 E) 3

7. log3 = m

log5 = n

$\Rightarrow$ **log450 = ?**

A) 2m + n + 1 B) 2n + m + 1 C) 2mn + 1 D) mn + 1 E) $m^2n + 1$

8. $\log_6 \frac{4}{5} + \log_6 \frac{5}{6} + \log_6 \frac{6}{7} + \ldots + \log_6 \frac{23}{24} = ?$

A) 2 B) 1 C) 0 D) – 1 E) – 2

9. $\log(5x + 2) - \log(4x + 3) = 0$

$\Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

10. $\log_5 x \cdot \log_x 125 = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

11. $\log_3 4 \cdot \log_4 5 \cdot \log_5 6 \ldots \log_{80} 81 = ?$

A) log81 B) log3 C) 2 D) 3 E) 4

12. $\ln(x + y) = \ln x + \ln y$

$\Rightarrow$ **x = ?**

A) $\frac{1}{y-1}$ B) $\frac{y}{y-1}$ C) $y - 1$ D) $\frac{y-1}{y}$ E) $\frac{1}{y+1}$

13. $\frac{1}{\log_2 30} + \frac{1}{\log_3 30} + \frac{1}{\log_5 30} = ?$

A) 1 B) 2 C) 3 D) 5 E) 30

14. $\log_{\sqrt{5}-2}(\sqrt{5} + 2) + \log_{3-2\sqrt{2}}(3 + 2\sqrt{2}) = ?$

A) – 5 B) – 4 C) – 3 D) – 2 E) – 1

15. $\frac{\log(\ln e) + \ln(\log 10) - \log 10^n}{\ln e^n} = ?$

A) 10 B) e C) 1 D) 0 E) – 1

16. $\log_4 9 = m$

$\Rightarrow$ $\log_{12} 18 = ?$

A) $\frac{2m}{m+2}$ B) $\frac{1}{m+2}$ C) $\frac{2m+1}{m+2}$ D) m E) $\frac{1}{m}$

1-A 2-D 3-B 4-E 5-C 6-E 7-A 8-D 9-A 10-C 11-E 12-B 13-A 14-D 15-E 16-C

TEST 2

1. $\log_x y = 5$

$\Rightarrow \dfrac{3\ln y - 5\ln x}{\ln y - 3\ln x} = ?$

A) $\frac{1}{5}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) 3 E) 5

2. $\ln 2 = a$

$\ln 3 = b$

$\Rightarrow \log_3 2 = ?$

A) $-\frac{a}{b}$ B) $-\frac{b}{a}$ C) $\frac{b}{a}$ D) $\frac{a}{b}$ E) ab

3. $e^{2 + \ln(3x + 1)} = 16 \cdot e^2$

$\Rightarrow x = ?$

A) $7e^2$ B) 6 C) 5 D) 4 E) 3e

4. $7^{\log x} + x^{\log 7} = 98$

$\Rightarrow x = ?$

A) log7 B) 2 C) 7 D) 49 E) 100

5. $\log x = \overline{2},15$

$\Rightarrow \operatorname{colog} x = ?$

A) 1,85 B) 1,75 C) – 1,75 D) – 1,85 E) – 2,15

6. $\operatorname{colog} x = -\operatorname{colog} 1000$

$\Rightarrow x = ?$

A) 0,1 B) 0,01 C) 0,001 D) 100 E) 1000

7. $\log x = 1,391$

$\Rightarrow \operatorname{colog}(x^3) = ?$

A) $\overline{5},827$ B) $\overline{4},827$ C) $\overline{3},827$ D) $\overline{4},872$ E) $\overline{3},872$

8. $\log x^2 + \operatorname{colog} y = 3$

$\log x^3 - \operatorname{colog} y = 2$

$\Rightarrow x = ?$

A) – 1 B) 1 C) 2 D) 10 E) 100

9. $f(x) = 3^{x-1}$

$\Rightarrow$ **$f^{-1}(x) = ?$**

A) $1 - \log_3 x$ B) $1 + \log_3 x$ C) $\log_{x-1} 3$

D) $\log_3(x+1)$ E) $\log_3(x-1)$

10. $e^{\ln(\sin^2 x)} + e^{2.\ln(\cos x)} = ?$

A) tanx B) e C) e^{-3} D) 0 E) 1

11. $x \in Z$,

$f(x) = \log_3(3x-6)$

$f^{-1}(x) > 29$

$\Rightarrow$ **min(x) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $A = \log_{\frac{1}{2}}\left(\frac{1}{8}\right) - x$

$B = 3x + \log_4 64$

$\Rightarrow$ **$\max[\log_2 (A \,.\, B)] = ?$**

A) 1 B) 3 C) $2 + \log_2 3$

D) 12 E) $\log_2 9$

13. $\log_2 12 = x$

$\Rightarrow$ **$\log_3 18 = ?$**

A) $\frac{2x-3}{x-2}$ B) $\frac{2x+3}{x-2}$ C) $\frac{2x+3}{x+2}$

D) $\frac{2x}{x+2}$ E) $\frac{x}{x+1}$

14. $\ln x = 2 + 3\log_x e$

$\Rightarrow \prod x = ?$

A) e B) e^2 C) e^3 D) -3 E) -1

15. $y = \log_x \sqrt{5}$

$x = (2\sqrt{5} - z)^{\frac{1}{y}}$

$\Rightarrow$ **z = ?**

A) $-\sqrt{5}$ B) 0 C) 1 D) $\sqrt{5}$ E) 5

16. $0 \le x \le 2\pi$

$\log_{\sin x}\cos x + \log_{\cos x}\sin x = 2$

$\Rightarrow$ **S. S. = ?**

A) $\left\{\frac{\pi}{3}\right\}$ B) $\left\{\frac{\pi}{2}, \frac{\pi}{3}\right\}$ C) $\left\{\frac{\pi}{4}\right\}$

D) $\left\{\frac{\pi}{4}, \frac{5\pi}{4}\right\}$ E) $\left\{\frac{\pi}{2}, \frac{\pi}{3}, \frac{\pi}{4}\right\}$

1-E 2-D 3-C 4-E 5-A 6-C 7-A 8-D 9-B 10-E 11-E 12-C 13-A 14-B 15-D 16-C

TEST 3

1. $\frac{e^x + e^{-x}}{e^x} = 4$

$\Rightarrow$ **x = ?**

A) $\ln\frac{\sqrt{3}}{3}$ B) $\ln\sqrt{3}$ C) ln3 D) ln2 E) e

2. log2 = 0,30103

olduğuna göre, 16^{15} sayısı kaç basamaklıdır?

According to log2 = 0,30103

How many digits is the number 16^{15}?

A) 18 B) 19 C) 20 D) 21 E) 22

3. $\sqrt{\ln 3e - \sqrt{\ln 81}} = ?$

A) $1 - \sqrt{\ln 3}$ B) $1 + \sqrt{\ln 3}$ C) $\sqrt{\ln 3} - 1$ D) $\sqrt{\ln 3}$ E) $\ln\sqrt{3}$

4. f: $R^+ \to R$ ye birebir ve örten bir fonksiyon olsun.

Let f: $R^+ \to R$ be a one to one and onto function

$f(x) = 2.\text{Arcsin}(\log_2 x)$

$\Rightarrow$ **$f^{-1}(\pi)$ = ?**

A) $\frac{\pi}{2}$ B) – 1 C) 0 D) 1 E) 2

5. $\log_{8x} 2x = y$

$\Rightarrow$ **$\log_x 2$ = ?**

A) $\frac{y-1}{y+3}$ B) $\frac{3y-1}{y-1}$ C) $\frac{1-y}{y+2}$ D) $\frac{1-y}{3y-1}$ E) $\frac{y+1}{y-1}$

6. log2 = 0,3

$5^{x+4} = 10^7$

$\Rightarrow$ **x = ?**

A) 7 B) 6 C) 5 D) 4 E) 3

7. ln(a + b) = 2

ln(a – b) = 0

$\Rightarrow$ **$\ln(4a^2 - 4a + 1)$ = ?**

A) e^4 B) $\sqrt{e}$ C) 2 D) 3 E) 4

8. $f(x) = 2x^3$

$g(x) = \log_2 x$

(gof)(x) = (hog)(x)

$\Rightarrow$ **h(x) = ?**

A) 3x + 1 B) $x^3 + 1$ C) $x^3 - 1$ D) 3x – 1 E) 3x + 3

9. $x, y \in Z^+$

$$\ln(x + y) = \ln(xy) + \ln\left(\frac{x}{y}\right)$$

x in <u>en küçük</u> değeri için $\frac{x}{y}$ kaça eşittir?

In order to require the smallest value for x.

What should be the value of $\frac{x}{y}$?

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{2}{3}$ E) $\frac{3}{4}$

10. $2^a = 5^b$

$\Rightarrow \frac{2}{a}(a + b \cdot \log_{\sqrt{2}} 5) = ?$

A) 8 B) 6 C) 4 D) 2 E) 1

11. $\log(\tan 48^\circ) = m$

$\log(\tan 42^\circ) = n$

$\Rightarrow$ **n = ?**

A) m^2 B) $m^2 - 1$ C) 2m D) $-m$ E) $\frac{1}{m}$

12. $\frac{\log 25 + 4.\log 2 - 2}{-1 + \log 160} = ?$

A) $\frac{1}{2}$ B) 1 C) 2 D) 4 E) 8

13. $f(x) = \frac{5^x - 5^{-x}}{2}$

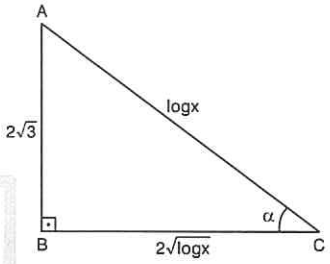
$\Rightarrow f^{-1}(x) = ?$ $(5^x > f(x))$

A) $\log_5 x$ B) $\log_5(\sqrt{x} - x)$

C) $\log_5(x + \sqrt{1 + x^2})$ D) $\log_5(x - \sqrt{1 + x^2})$

E) $\log_5(x^2 - \sqrt{x})$

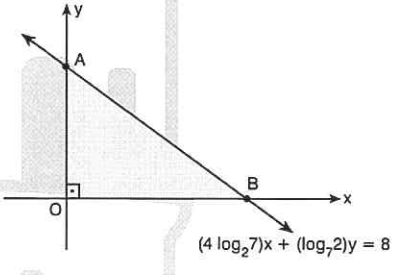
14.



$\Rightarrow \tan\alpha = ?$

A) 1 B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{2}}{2}$ D) $\sqrt{2}$ E) $\sqrt{3}$

15.



$\Rightarrow$ **A(AOB) = ?**

A) log7 B) 2 C) 4 D) 8 E) 16

1-A 2-B 3-C 4-E 5-D 6-B 7-E 8-A 9-B 10-B 11-D 12-A 13-C 14-C 15-D

TEST 4

1. $A \in Z$

$x > 1 \quad y > 1$

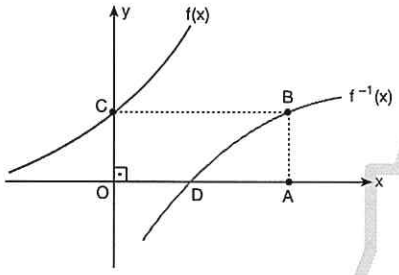
$x + y = 18$

$A = \log_3(x \cdot y)$

$\Rightarrow$ **max(A) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

2.



$f(x) = 2^{x+1}$

OABC dikdörtgen (Rectangle)

$\Rightarrow$ **|DA| = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

3. $\log_5 x = m$

$\log_7 x = n$

m ve n için aşağıdakilerden hangisi doğrudur?
Which of the followings expression of m and n is correct?

A) $m + n \neq 0$ B) $m = 0,\ n \neq 0$

C) $m \neq 0,\ n = 0$ D) $m = 0,\ n = 0$

E) $m \cdot n = 1$

4. $\log_5(3x + 1) = \log_3(x^2 - 3) \cdot \log_5 3$

$\Rightarrow$ **S. S. = ?**

A) $\{-1, 4\}$ B) $\{-1\}$ C) $\{4\}$

D) $\varnothing$ E) R

5. $x \in R$

$\log x < 0$

$\Rightarrow$ **? < x < ?**

A) $x < 0$ B) $1 < x < 10$ C) $0 < x < 1$

D) $-1 < x < 0$ E) $10 < x < 100$

6. $\log x = 0{,}04$

$\log y = 0{,}16$

$\Rightarrow$ **$5 \cdot \log\sqrt{\frac{y}{x}} = ?$**

A) 0,2 B) 0,3 C) 0,4 D) 0,5 E) 0,6

7. $e^{2x} - 5.e^x + 6 = 0$

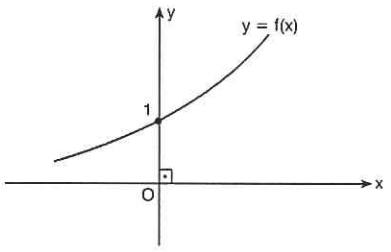
S. S. = $\{x_1\ x_2\}$

$\Rightarrow$ **$x_1 + x_2 = ?$**

A) ln6 B) 2.ln5 C) ln5

D) ln3 E) 2.ln3

8.



⇒ **f(x) = ?**

A) lnx B) $\left(\frac{1}{3}\right)^x$ C) e^x

D) logx E) $x^2 + 1$

9. $\log_{a\,.\,b}(a) = k$

⇒ **$\log_b(a\,.\,b)$ = ?**

A) $\frac{1}{k}$ B) $\frac{1}{k-2}$ C) k

D) $\frac{1}{1-k}$ E) k + 1

10. $(\log_3 x)\,.\,(\log_4 x) = \log_2 9$

⇒ $\prod x$ = ?

A) 9 B) $\frac{2}{9}$ C) $\frac{1}{9}$ D) 2 E) 1

11. $x \in Z$

$$\log_3 \frac{1-2x}{x} \leq 0$$

⇒ **S. S. = ?**

A) $\{0\}$ B) $\{0, 1\}$ C) $\{1\}$ D) $\{1, 2\}$ E) $\varnothing$

12. a rakam (numeral)

$a \neq 0$

$\log(3x - 2) = 1,a$

x hangi aralıkta değer alır?
Which interval will "x" be located in?

A) (0, 1) B) (4, 34) C) $\left(\frac{1}{10}, 1\right)$

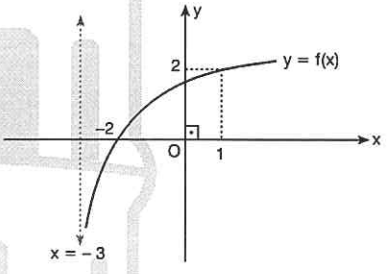
D) $\left(0, \frac{7}{10}\right)$ E) $\left(\frac{1}{10}, 3\right)$

13. $\log x = 3,65$

olduğuna göre, $x^5\,.\,10^3$ sayısı kaç basamaklıdır?
According to $\log x = 3,65$
How many digits is the number $x^5\,.\,10^3$?

A) 25 B) 24 C) 23 D) 22 E) 21

14.



$f(x) = \log_a(x + 3)$

⇒ **$f^{-1}(4) - f(5)$ = ?**

A) 10 B) 9 C) 8 D) 7 E) 6

1-A 2-E 3-D 4-C 5-C 6-B 7-A 8-C 9-D 10-E 11-E 12-B 13-D 14-A

TEST 5

1. $\log_x 6! + \log_x 7! = 1$

⇒ **x = ?**

A) 10! B) 2 . 9! C) 3 . 9!
D) 5 . 8! E) 9!

2. $(abcd)_4 = a \cdot 4^3 + b \cdot 4^2 + c \cdot 4 + d$

$(ef)_3 = 3e + f$

$A = \log_4(abcd)_4 \cdot \log_3(ef)_3$

⇒ **? < A < ?**

A) $1 < A < 10$ B) $3 < A < 11$ C) $3 < A < 8$
D) $3 \leq A \leq 8$ E) $3 \leq A < 8$

3. $y = x^{\frac{\ln(\ln x)}{\ln x}}$

⇒ **y = ?**

A) x . lnx B) lnx C) 1 D) x E) 0

4. $f(x) = \log_7(2x - 1)$

$g(x) = 2^{\log_x 9}$

$(fog)_{(m)} = 1$

⇒ **m = ?**

A) 8 B) 6 C) 4 D) 3 E) 1

5. $x \in R^+$

$f(\log_2 x) = 2x$

⇒ **f(n − 1) = ?**

A) 2n B) 2^n C) 2n − 1 D) 2n + 1 E) n^2

6. a, b, c, d rakam (numeral)

log28 = a,bcd

⇒ **a = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

7. $x \in R^+$

$x^{\log x} = 100x$

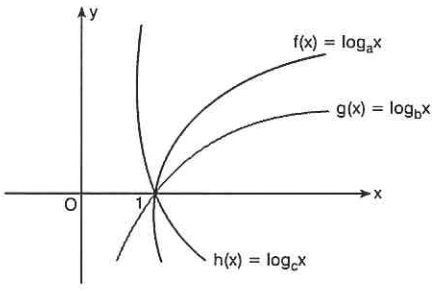
S. S. = $\{x_1, x_2\}$

$x_1 > x_2$

⇒ **$\log x_1 - \log x_2$ = ?**

A) − 1 B) − 3 C) 3 D) 4 E) 5

8.

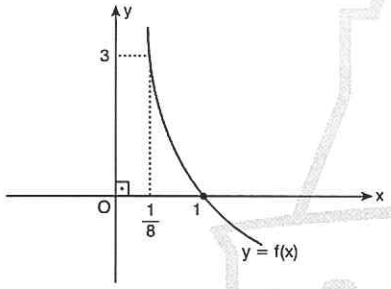


⇒ **? < ? < ?**

A) $a < b < c$ B) $a < c < b$ C) $b < a < c$

D) $c < b < a$ E) $c < a < b$

9.



$f(x) = \log_a x$

⇒ **$f(16) \cdot f^{-1}(4) = ?$**

A) $-\frac{1}{8}$ B) $-\frac{1}{4}$ C) $-\frac{1}{2}$ D) -1 E) -2

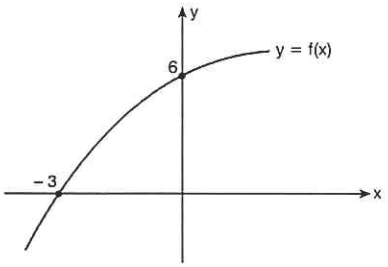
10. $f(x) = \ln\left[\log_{\frac{1}{3}}(2x-6)\right]$

⇒ **S. S. = ?**

A) $(-\infty, 3)$ B) $\left(-\infty, \frac{7}{2}\right)$ C) $\left(3, \frac{7}{2}\right)$

D) $(3, \infty)$ E) $\left(\frac{7}{2}, \infty\right)$

11. $a \neq 0$



$y = a \cdot \log_2\left(\frac{x}{3} + 2b\right)$

⇒ **a + b = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

12. $A = (\log_6 3)^2 + (\log_6 2)^2$

$B = \log_6 16 \cdot \log_6 \sqrt{3}$

⇒ **A + B = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

13. $\sqrt{\frac{\log_a b + \log_b a + 2}{\log_a b}} = ?$

A) $1 + \log_a b$ B) $1 + \log_b a$ C) 1

D) $\frac{1}{1 + \log_a b}$ E) $\frac{1}{1 + \log_b a}$

14. $\frac{1}{1 + \log_3 42} + \frac{1}{1 + \log_6 21} + \frac{1}{1 + \log_7 18} = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

1-A 2-E 3-B 4-D 5-B 6-D 7-C 8-E 9-B 10-C 11-C 12-E 13-B 14-A

1. $\ln a = 5$

$\ln b = 4$

$\ln(a - b) = x$

ise x hangi aralıkta değer alır?
Which interval will "x" be located in?

A) $0 < x < 1$ B) $1 < x < 2$ C) $2 < x < 3$

D) $3 < x < 4$ E) $4 < x < 5$

2. $\log_8 5 = a$

$\log_4 3 = b$

$\Rightarrow$ **$\log_{15} 9 = ?$**

A) $\frac{2b}{3a + 2b}$ B) $\frac{3a}{3a + 2b}$ C) $\frac{4b}{3a + 2b}$

D) $\frac{3a + 4b}{2a + 3b}$ E) $\frac{5a + 2b}{a + b}$

3. $6^x = 3^y$

$\Rightarrow$ $\frac{x + y}{x - y} = ?$

A) $\log_2 18$ B) $-\log_2 18$ C) $\log_2 5$

D) $-\log_2 5$ E) 1

4. $2 \cdot (\log 1 + \log 2 + \log 3 + \ldots + \log 6) + \log 7 = \log k!$

$\Rightarrow$ **$k = ?$**

A) 11 B) 10 C) 9 D) 8 E) 7

5. $\frac{1 + \log 90}{\log 30} = ?$

A) 2 B) 3 C) 10 D) 30 E) 90

6. $\sqrt{\log_3 6 + \sqrt{\log_3 16}} = ?$

A) $\sqrt{\log_3 2} + 1$ B) $\sqrt{\log_3 2} - 1$ C) $\log_3 2 + 1$

D) $\log_3 2 - 1$ E) 10

7. $(\log x) : (\log y) : \log(z) = 1 : 3 : 5$

$\Rightarrow$ **$\log_x(yz) = ?$**

A) 2 B) 4 C) 8 D) 16 E) 32

8. $\log 8! = m$

$\log 35 = n$

⇒ **$7\log 2 + 2\log 3 = ?$**

A) $m + n$ B) $2m - 3n$ C) $2m + 3n$ D) $m - n$ E) $3m + 2n$

9. $0 < x < y < 1$

olduğuna göre, aşağıdakilerden hangisi yanlıştır?

Which of the following is wrong?

A) $\log_x y > 0$ B) $\log_{\frac{1}{x}} \frac{1}{y} > 0$ C) $\log_x \frac{1}{y} < 0$ D) $\log_{\frac{1}{x}} y > 0$ E) $x + y > 0$

10. $n \in Z$,

$x_1 \neq x_2$

$x^2 - 4x + \log_2 n = 0$

S. S. $= \{x_1, x_2\}$

⇒ **max(n) = ?**

A) 13 B) 14 C) 15 D) 16 E) 17

11. $f(x) = \ln(1 - \ln x)$

⇒ **S. S. = ?**

A) (0, 1) B) (0, e) C) (1, e) D) (2, e) E) R^+

12. $\frac{x \cdot \ln(x-1)}{\ln x} < 0$

⇒ **S. S. = ?**

A) (0, 1) B) (– 2, 3) C) (2, 4) D) (– 1, 2) E) (1, 2)

13. $\log_{ab} a + 10 \cdot \log_b ab = 4$

⇒ **$\sum \log_b a = ?$**

A) – 1,7 B) – 1,6 C) – 1,5 D) – 1,2 E) – 1

14. $(\sqrt{x})^{-2 + \log_2 \sqrt{x}} = 8$

S. S. $= \{x_1, x_2\}$

⇒ **$x_1 \cdot x_2 = ?$**

A) 8 B) 16 C) 20 D) 24 E) 32

1-E 2-C 3-B 4-B 5-A 6-A 7-C 8-D 9-D 10-C 11-B 12-E 13-A 14-B

ÜNİTE 8

Unit 8

Toplam ve Çarpım Sembolü /
Summation and Product Notation

TEST 1

1. I. $1 + 2 + 3 + \ldots + n = \dfrac{n \cdot (n+1)}{2}$

II. $2 + 4 + 6 + \ldots + 2n = n(n+1)$

III. $1 + 3 + 5 + \ldots + (2n-1) = n^2$

IV. $1 + r + r^2 + r^3 + \ldots + r^{n-1} = \dfrac{r^n - 1}{r - 1}$

ifadelerinden hangileri doğrudur?
Which of the expressions above are true?

A) I ve II B) I ve III C) II ve III D) I, II ve III E) I, II, III ve IV

2. $\sum_{k=1}^{35} k \cdot k! = ?$

A) $35! - 1$ B) $36! - 1$ C) $35!$ D) $36!$ E) $37!$

3. $\sum_{k=1}^{20} (-3) + \sum_{k=1}^{10} 4 + \sum_{k=1}^{20} 5 = ?$

A) 80 B) 70 C) 60 D) 50 E) 40

4. $\sum_{k=1}^{4} k^3 + \sum_{k=-2}^{3} 5 = ?$

A) 110 B) 120 C) 130 D) 140 E) 150

5. $\sum_{k=1}^{3} (k^3 + 3^k) = ?$

A) 71 B) 72 C) 73 D) 74 E) 75

6. $\sum_{k=-70}^{70} k^7 + \sum_{r=-10}^{10} r^9 = ?$

A) 80^9 B) 70^9 C) 20^9 D) 0 E) -80

7. $\sum_{k=-5}^{5} r^3 = ?$

A) $10r^3$ B) $11r^3$ C) 0 D) 125 E) 625

8. $\sum_{k=1}^{10} (k^2 + 3k) = ?$

A) 100 B) 400 C) 540 D) 550 E) 560

9. $\prod_{k=1}^{20} k = ?$

A) 20 B) 20! C) 21! D) 22! E) 20^{20}

10. $\prod_{k=3}^{5} (k+2) = ?$

A) 8! B) 210 C) 200 D) 5! E) 100

11. $\prod_{k=8}^{27} k = \frac{a!}{b!}$

$\Rightarrow a + b = ?$

A) 32 B) 33 C) 34 D) 35 E) 36

12. $\prod_{k=-7}^{17} k + \sum_{k=-7}^{17} 2 = ?$

A) 24! B) 17! + 48 C) 17! + 50 D) 48 E) 50

13. $\prod_{k=1}^{40} \left(\frac{k+2}{k+1}\right) = ?$

A) 21 B) 22 C) 23 D) 42 E) 43

14. $\prod_{k=-5}^{20} (2k + 12) = ?$

A) 2^{25} B) 25! C) $2^{25} \cdot 25!$ D) $2^{26} \cdot 26!$ E) 2^{26}

15. $8 + 13 + 18 + 23 + \ldots + 93$

toplamı aşağıdakilerden hangisi ile ifade edilir?
Which of the following states the sum of
$8 + 13 + 18 + 23 + \ldots + 93$?

A) $\sum_{k=8}^{93} k$ B) $\sum_{k=1}^{18} (5k + 3)$ C) $\sum_{k=8}^{18} (5k + 3)$ D) $\sum_{k=1}^{86} (k + 7)$ E) $\sum_{k=8}^{93} (5k + 3)$

16. $\sum_{k=1}^{48} \left(\sqrt{k+1} - \sqrt{k}\right) = ?$

A) 9 B) 8 C) 7 D) 6 E) 5

1-E 2-B 3-A 4-C 5-E 6-D 7-B 8-D 9-B 10-B 11-C 12-E 13-A 14-D 15-B 16-D

TEST 2

1. $P(x) = \sum_{k=1}^{8} (k \cdot x^k)$

P(x) polinomunun (x – 1) ile bölümünden kalan kaçtır?
What is the remainder of the polynomial P(x) dividing by (x – 1)?

A) 28 B) 30 C) 32 D) 34 E) 36

2. $x \in C,\ x \neq 1$

$$\sum_{r=0}^{5} x^{2r} = x^{10}$$

$\Rightarrow$ **$x^{10} + x^{20} = ?$**

A) 0 B) 1 C) 2 D) 3 E) 4

3. $$\prod_{k=1}^{n} (3 \cdot a_k) = 3^{n+1}$$

$$\prod_{k=1}^{n} (a_k \cdot b_k) = 81$$

$\Rightarrow$ $$\prod_{k=1}^{n} (b_k) = ?$$

A) 3 B) 9 C) 27 D) 81 E) 243

4. $$\prod_{a=b}^{c} b = \sum_{a=1}^{b} b$$

$\Rightarrow$ **$c - b = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

5. $a_1 = 1$

$a_2 = 2 + 3$

$a_3 = 4 + 5 + 6$

$a_4 = 7 + 8 + 9 + 10$

$\Rightarrow$ **$a_{10} = ?$**

A) 495 B) 505 C) 525 D) 535 E) 545

6. $6 + 8 + 10 + \ldots + 2x = x^2 + 5$

$\Rightarrow$ **$x = ?$**

A) 8 B) 9 C) 10 D) 11 E) 12

7. $$\sum_{k=1}^{n} \frac{1}{k} = a$$

$$\sum_{n=1}^{n} \frac{1}{k+2} = b$$

$\Rightarrow$ $$\sum_{k=1}^{n} \frac{k+3}{k(k+2)} = ?$$

A) $\frac{3a - b}{2}$ B) $\frac{3a + b}{2}$ C) $3(a - b)$ D) $\frac{3}{2}(a - b)$ E) $\frac{a - 2b}{3}$

8. $$\sum_{k=0}^{9} 4k^2 = 1140$$

$\Rightarrow$ **$1 \cdot 3 + 3 \cdot 5 + 5 \cdot 7 + \ldots + 19 \cdot 21 = ?$**

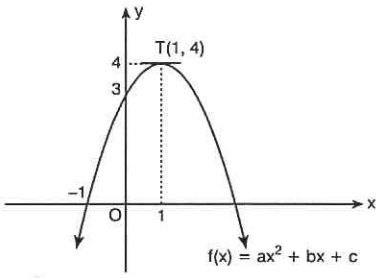
A) 385 B) 1500 C) 1510 D) 1520 E) 1530

9. $f(x) = |x - |x||$

$\Rightarrow \sum_{k=-10}^{140} f(k) = ?$

A) 140 B) 110 C) 55 D) 15 E) 10

10.



$\Rightarrow \sum_{k=2}^{5} f(k-2) = ?$

A) 13 B) 12 C) 11 D) 10 E) 9

11. $f(x) = \prod_{k=1}^{x} \frac{k^2}{k+1}$

$\Rightarrow (x+1) \cdot f(x) = ?$

A) x^{-1} B) x C) x! D) x^2 E) (x + 1)!

12. $\sum_{k=5}^{n} (k-2)!$

ifadesi aşağıdakilerden hangisine tam bölünemez?

Which of the following numbers does not divide

$\sum_{k=5}^{n} (k-2)!$?

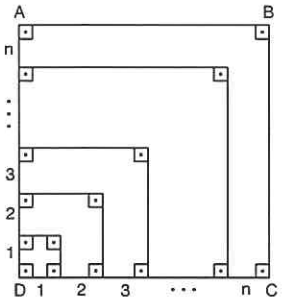
A) 30 B) 12 C) 6 D) 5 E) 3

13. $\sum_{k=-5}^{5} (6x^3 + x^2 - 7x + a - 2) = 132$

$\Rightarrow a = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

14.



ABCD kare (square)

$\Rightarrow$ **A(ABCD) = ?**

A) $\sum_{k=1}^{n} (k^3 + k)$ B) $\sum_{k=1}^{n} k^3$ C) $\sum_{k=1}^{n} (k^3 + k)$

D) $\sum_{k=1}^{n} \frac{k \cdot (k+1)}{2}$ E) $\sum_{k=1}^{n} (k^2 + k)$

15. $\prod_{k=1}^{n} \prod_{n=1}^{m} n \cdot k = ?$

A) $(n!)^m \cdot (m!)^k$ B) $(n!m!)^k$ C) $(n \cdot m)!$

D) $(m!)^n \cdot (n!)^m$ E) $(n^k \cdot m^n)!$

16. $A = \sum_{k=n}^{2n} (k+n)$

$B = \sum_{k=1}^{n} (k)$

$\Rightarrow \frac{A}{B} = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

1-E 2-C 3-C 4-A 5-B 6-D 7-A 8-E 9-B 10-D 11-C 12-B 13-B 14-B 15-D 16-C

TEST 3

1. $\prod_{k=1}^{20} (k^2 + k) = ?$

A) 20! B) 21! C) 20! . 21!
D) 20 . 21! E) 2^{20} . 21!

2. $\prod_{k=5}^{25} 2^{k-4} = ?$

A) 2^{231} B) $2^{25!}$ C) $2^{21!}$ D) 0 E) 2^{25}

3. $\prod_{k=1}^{19} \sqrt{7^k} = ?$

A) 0 B) 7 C) $\sqrt{7}$ D) 7^{190} E) 7^{95}

4. $A = \sum_{k=0}^{5} 2^k$

$B = \sum_{k=1}^{4} 3^k$

$\Rightarrow$ **B – A = ?**

A) 120 B) 63 C) 60 D) 57 E) 47

5. $\sum_{k=3}^{32} \left(\frac{1}{k^2 + k}\right) = ?$

A) $\frac{1}{3}$ B) $\frac{10}{33}$ C) $\frac{1}{4}$ D) 0 E) 1

6. $\sum_{k=0}^{7} \binom{7}{k} = ?$

A) 7^7 B) 7! C) 77 D) 7^2 E) 2^7

7. $\sum_{k=1}^{50} [(-1)^k . k] = ?$

A) 50 B) 25 C) 15 D) 10 E) 5

8. $\sum_{k=1}^{n} k = A$

$\sum_{k=1}^{n} (4k^3 + 2k)$

ifadesinin A türünden değeri nedir?

What is the value of the expression above in terms of A?

A) $4A^3 + 2A$ B) $4A^2 + 2A$ C) 6A
D) 2A E) $4A^3 + 2$

9. $\sum_{n=2}^{5} [(n-2) \cdot (n-3) \cdot (n-4)] = ?$

A) 0 B) 2 C) 4 D) 6 E) 8

10. $\sum_{k=8}^{18} (k^2 - 14k + 49) = ?$

A) 506 B) 496 C) 486 D) 476 E) 466

11. $\sum_{k=20}^{33} (k^{\log_k 10}) = ?$

A) 33! B) 110 C) 120 D) 130 E) 140

12. $\sum_{k=2}^{17} a_k = 120$

$\sum_{k=18}^{38} a_k = 130$

$\Rightarrow \sum_{k=2}^{38} a_k = ?$

A) 110 B) 120 C) 150 D) 250 E) 260

13. $\sum_{k=1}^{63} \left[\log_2 \left(\frac{k+1}{k}\right)\right] = ?$

A) 64 B) 32 C) 16 D) 6 E) 4

14. $i = \sqrt{-1}$

$\Rightarrow \sum_{k=1}^{1149} i^k = ?$

A) $2 - i$ B) $2 + i$ C) i^3 D) i^2 E) i

15. $\sum_{k=1}^{89} (\sin^2 k^\circ) = ?$

A) 44,5 B) 45 C) 88 D) 89 E) 90

16. $\sum_{k=-3}^{5} (a - b) = 90$

$\sum_{k=2}^{15} (a + b) = 280$

$\Rightarrow a = ?$

A) 30 B) 20 C) 15 D) 10 E) 5

1-C 2-A 3-E 4-D 5-B 6-E 7-B 8-B 9-D 10-A 11-E 12-D 13-D 14-E 15-A 16-C

TEST 4

1. $x^2 + 3x - 5 = 0$

S. S. $= \{x_1, x_2\}$

$\Rightarrow \prod_{k=1}^{2} (x_k + 1) = ?$

A) -8 B) -7 C) -2 D) -1 E) 0

2. $\sum_{k=1}^{8} \sum_{m=1}^{8} \sum_{n=1}^{8} 16 = ?$

A) 2^{25} B) 2^{23} C) 2^{20} D) 2^{18} E) 2^{13}

3. $4 . 9 . 14 . 19 . \ldots . 49 = ?$

A) $\prod_{k=4}^{49} k$ B) $\prod_{k=4}^{49} (5k - 1)$ C) $\prod_{k=1}^{49} (5k - 1)$

D) $\prod_{k=4}^{10} (5k - 1)$ E) $\prod_{k=1}^{10} (5k - 1)$

4. $\prod_{k=1}^{n} b_k = n^2 - 4n + 4$

$\Rightarrow b_{10} = ?$

A) $\frac{64}{49}$ B) $\frac{100}{81}$ C) $\frac{121}{100}$ D) 1 E) 0

5. $\sum_{k=1}^{5} (k + 3) = \prod_{n=1}^{2} (n + x)$

$\Rightarrow x = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

6. $\sum_{i=1}^{4} \sum_{j=1}^{20} (i . j) = ?$

A) 8000 B) 4000 C) 3800 D) 2100 E) 210

7. $a, b, c, d, e \in Z$

$\prod_{k=-7}^{3} (k + 8) = 2^a . 3^b . 5^c . 7^d . 11^e$

$\Rightarrow a + b + c + d + e = ?$

A) 13 B) 14 C) 15 D) 16 E) 17

8. $x^2 + 7x + 6 = 0$

S. S. $= \{x_1, x_2\}$

$f(x) = 2x + 1$

$\Rightarrow \sum_{k=1}^{2} [x_k + f(x_k)] = ?$

A) -20 B) -19 C) -18 D) -17 E) 23

9. $\sum_{n=1}^{k} S_n = k^2 + 6$

$\Rightarrow S_7 = ?$

A) 65 B) 42 C) 15 D) 14 E) 13

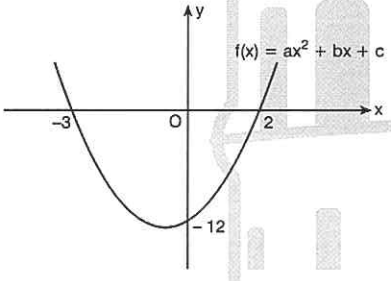
10. $\prod_{k=2}^{31} \log_k(k+1) = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

11. $1 \cdot 2 + 2 \cdot 3 + 3 \cdot 4 + \ldots + 10 \cdot 11 = ?$

A) 460 B) 450 C) 440 D) 430 E) 420

12.



$\Rightarrow \prod_{k=1}^{22} f(k) = ?$

A) 22! B) 22 C) 0 D) – 22 E) – 22!

13. $\log_7\left(\prod_{k=1}^{n} 7^k\right) = 45$

$\Rightarrow n = ?$

A) 6 B) 7 C) 8 D) 9 E) 10

14. $\prod_{k=1}^{20} \frac{k^2 + 9k + 20}{k^2 + 11k + 30} = ?$

A) $\frac{1}{15}$ B) $\frac{3}{65}$ C) $\frac{5}{17}$ D) $\frac{20}{67}$ E) 0

15. $\prod_{k=1}^{179} (\cos k^\circ) = ?$

A) $-\frac{1}{2}$ B) $-\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{3}}{2}$ D) $\frac{\sqrt{2}}{2}$ E) 0

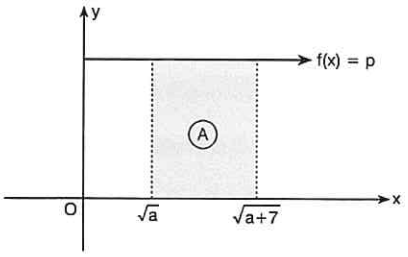
16. $\prod_{k=1}^{58} \left(7 - \frac{k}{5}\right) = ?$

A) 0 B) 35! C) 58! D) 59! E) 58! – 1

1-B 2-E 3-E 4-A 5-C 6-D 7-D 8-B 9-E 10-A 11-C 12-C 13-D 14-B 15-E 16-A

TEST 5

1.



$A = (2m - 3)\ br^2$

$\sum_{k=a}^{a+6} \left(\sqrt{k} - \sqrt{k+1}\right) . f(k) = m - 18$

$\Rightarrow$ **m = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

2. $-1 + 4 - 9 + 16 - 25 \ldots - 169$

toplamı aşağıdakilerden hangisi ile ifade edilir?

Which of the following states the sum

$-1 + 4 - 9 + 16 - 25 \ldots - 169$?

A) $\sum_{r=1}^{13} (-1)^r . r^2$ B) $\sum_{r=1}^{169} (-1)^n . r$ C) $\sum_{r=1}^{13} r^2$

D) $\sum_{r=1}^{169} r$ E) $\sum_{r=1}^{13} (-1)^{r+1} . r$

3. $\sum_{k=1}^{20}$ **(0,0kk) = ?**

A) 2,31 B) 2,4 C) 2,42 D) 2,48 E) 3

4. $\sum_{k_n=1}^{3} \ldots \sum_{k_2=1}^{3} \sum_{k_1=1}^{3} 4 = 6^5 . 2^2$

$\Rightarrow$ **n = ?**

A) 9 B) 8 C) 7 D) 6 E) 5

5. $f(x) = 2x - 1$

$\sum_{n=1}^{10} n^2 = 385$

$\sum_{n=1}^{10} n = 55$

$\Rightarrow \sum_{n=1}^{10} [f(n)]^2 = ?$

A) 2012 B) 1520 C) 1330 D) 1240 E) 1160

6. $\sum_{k=1}^{n} \frac{1}{(2k-1) . (2k+1)} = \frac{n}{2n+1}$

$\Rightarrow \frac{1}{9 . 11} + \frac{1}{11 . 13} + \frac{1}{13 . 15} \ldots + \frac{1}{25 . 27} = ?$

A) $\frac{1}{9}$ B) $\frac{1}{15}$ C) $\frac{1}{27}$ D) $\frac{1}{36}$ E) $\frac{1}{45}$

7. $\sum_{k=1}^{n} k . f(n) = 2^n$

$\Rightarrow$ **f(4) = ?**

A) $\frac{5}{8}$ B) $\frac{8}{5}$ C) $\frac{2}{3}$ D) $\frac{3}{2}$ E) 1

8. $\prod_{n=4}^{27} \log_n(n+1) = m$

$\Rightarrow$ **$\log_7 4$ = ?**

A) $\frac{1}{m-1}$ B) $\frac{1}{m+1}$ C) m − 1 D) m + 1 E) 2m

9. $f(n) = \prod_{k=1}^{n} \frac{k^2}{k+1}$

$\Rightarrow$ **n! – f(n) = ?**

A) $\frac{1}{n}$ B) n C) $\frac{f(n)}{n}$

D) n . f(n) E) 2n . f(n)

10. 3 ile bölündüğünde 1 kalanını veren ve 5 ile bölündüğünde 0 kalanını veren üç basamaklı doğal sayıların toplamı c dir.

c sayısının 30 ile bölümünden kalan kaçtır?

The sum of three digits natural numbers which give a remainder of 1 dividing by 3 and a remainder of 0 dividing by 5, is C.

What is the remainder of C dividing by 30 ?

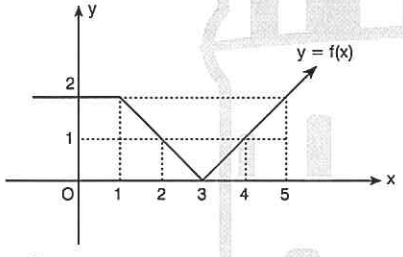
A) 0 B) 3 C) 13 D) 15 E) 25

11. $\sum_{n=1}^{p} a_n = p^2 + p + 1$

$\Rightarrow$ **a_4 = ?**

A) 6 B) 8 C) 10 D) 12 E) 15

12.



$\Rightarrow \sum_{a=-2}^{5} a \,.\, f(a) = ?$

A) 11 B) 12 C) 13 D) 14 E) 15

13. $\sum_{k=1}^{n} k = a$

$\sum_{k=1}^{n} k^2 = b$

$\Rightarrow$ **$1^2 \,.\, 2 + 2^2 \,.\, 3 + 3^2 \,.\, 4 + \ldots + n^2 \,.\, (n+1) = ?$**

A) $a^2 + b$ B) $a^3 + b^2$ C) $a + b^2$

D) $a^2 + b^2$ E) $a + 2b$

14. f: N $\rightarrow$ R

$f(x) = \sum_{n=1}^{8} (x + n)$

$\Rightarrow$ **f(x – 4) = ?**

A) f(x) – 2 B) f(x) + 12 C) f(x) – 32

D) f(x) + 32 E) f(x) + 2

15. $\sum_{k=1}^{n} (k+1)^3 - \sum_{k=1}^{n} k^3 = 124$

$\Rightarrow$ **n = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

16. $1 \,.\, 2 + 2 \,.\, 3 + 3 \,.\, 4 + \ldots + n \,.\, (n+1) = \frac{n \,.\, (n+1) \,.\, (n+2)}{3}$

$\Rightarrow$ **$m \,.\, (m+1) + (m+1) \,.\, (m+2) + \ldots + 2m \,.\, (2m+1) = ?$**

A) $\frac{1}{3} \,.\, m\,(m+1) \,.\, (7m+3)$

B) $\frac{1}{3} \,.\, m\,(m+1) \,.\, (7m+5)$

C) $\frac{1}{3} \,.\, m\,(m+1) \,.\, (6m+7)$

D) $\frac{1}{3} \,.\, m\,(m+1) \,.\, (7m+8)$

E) $\frac{1}{3} \,.\, m\,(m+1) \,.\, (5m+7)$

1-B 2-A 3-A 4-E 5-C 6-C 7-B 8-A 9-D 10-A 11-B 12-B 13-A 14-C 15-B 16-B

TEST 6

1. $\sum_{n=1}^{35} \frac{\sqrt{n}}{n+\sqrt{n^2+n}} = ?$

A) 8 B) 7 C) 6 D) 5 E) 4

2. $\sum_{n=10}^{20} n = A$

$\sum_{n=5}^{12} n = B$

$\Rightarrow \sum_{n=5}^{20} n = ?$

A) A + B – 9 B) A + B – 11 C) A + B – 21 D) A + B – 23 E) A + B – 33

3. $a \in Z^+$

$\sum_{n=1}^{6} \binom{6}{n} . a^n = 728$

$\Rightarrow$ **a = ?**

A) 6 B) 5 C) 4 D) 3 E) 2

4. $\sum_{k=1}^{4} a . \sum_{k=1}^{4} k = \sum_{k=1}^{4} (a + k)$

$\Rightarrow$ **a = ?**

A) $\frac{11}{36}$ B) $\frac{7}{18}$ C) $\frac{2}{3}$ D) $\frac{4}{9}$ E) $\frac{5}{18}$

5. $\sum_{k=1}^{n} k^3 = \left(\sum_{k=1}^{15} k\right) . \left(\sum_{k=1}^{15} k\right)$

$\Rightarrow$ **n = ?**

A) 19 B) 18 C) 17 D) 16 E) 15

6. $\sum_{n=1}^{a} (x_n + 3) = 3a + b$

$\sum_{n=1}^{a} [x_n (y_n - 2)] = 5 - 2b$

$\Rightarrow \sum_{n=1}^{a} (x_y . y_n) = ?$

A) 3 B) 4 C) 5 D) b + 5 E) 7 – b

7. $\prod_{k=3}^{10} \left(\frac{k^2-1}{k^2-4}\right) = ?$

A) 2 B) 3 C) 4 D) 6 E) 9

8. $n \in N,$

$\prod_{k=5}^{16} k^3 = A . 6^n$

$\Rightarrow$ **max(n) = ?**

A) 21 B) 18 C) 17 D) 15 E) 10

9. $S_n = \sum_{k=1}^{n} k!$

$\Rightarrow \sum_{m=1}^{3} \sum_{k=1}^{3} S_k = ?$

A) 39 B) 38 C) 28 D) 24 E) 18

10. $x = \sum_{k=1}^{n} \ln k$

$\Rightarrow e^x = ?$

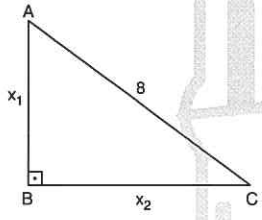
A) n B) 2n C) n! D) 2n! E) ln(n)

11. $1 + (1+2) + (1+2+3) + \ldots + (1+2+3+\ldots+n) = 84$

$\Rightarrow n = ?$

A) 5 B) 7 C) 10 D) 13 E) 15

12.



$f: R \to R$

$f(x) = 3x$

$\Rightarrow \sum_{k=1}^{2} x_k \cdot f(x_k) = ?$

A) 192 B) 190 C) 182 D) 180 E) 172

13. $A = 1 + 10 + 10^2 + \ldots + 10^9$

$B = 1 + 10 + 10^2 + 10^3 + 10^4$

$\Rightarrow \sqrt{A - 2B} = ?$

A) 333 B) 3330 C) 3332 D) 33333 E) 9999

14. $\sum_{k=0}^{n} a^k = (a+1) \cdot (a^2+1) \cdot (a^4+1) \cdot (a^8+1)$

$\Rightarrow n = ?$

A) 15 B) 14 C) 13 D) 12 E) 10

15. $\dfrac{\sum_{n=1}^{99} \sin(nx)}{\sum_{n=1}^{99} \cos(nx)} = \tan\beta x$

$\Rightarrow \beta = ?$

A) 51 B) 50 C) 49 D) 48 E) 47

16. $g(x) = \prod_{n=2}^{ax} a^5$

$f(x) = \sum_{k=a}^{x} \left(\dfrac{2x-1}{a}\right)$

$f(15) = 203$

$\Rightarrow g(3) = ?$

A) 2^{15} B) 2^{20} C) 2^{25} D) 2^{30} E) 2^{35}

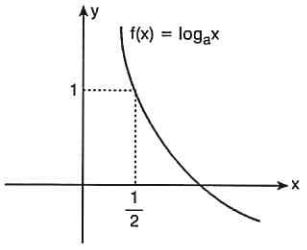
1-D 2-E 3-E 4-E 5-E 6-C 7-B 8-D 9-A 10-C 11-B 12-A 13-D 14-A 15-B 16-C

1. $5 \cdot 2^x = 4 \cdot 3^y = 1$

$\Rightarrow$ **x . y = ?**

A) $\frac{\ln 25}{\ln 3}$ B) $\frac{\ln 5}{\ln 3}$ C) $\frac{\ln 4}{\ln 7}$ D) $\frac{\ln 7}{\ln 2}$ E) $\frac{\ln 36}{\ln 5}$

2.



$\Rightarrow$ **(fof)$\left(\frac{1}{4}\right)$ = ?**

A) 1 B) 2 C) 0 D) – 2 E) – 1

3. $x \in Z$

$0 \le \log_3(x - 5) \le 2$

$\Rightarrow$ **Σx = ?**

A) 80 B) 89 C) 90 D) 91 E) 92

4. $a^{\log_a b} = e^{\ln 8}$

$\Rightarrow$ **b = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

5. $\sqrt{\log 5 + \log 2}$ **= ?**

A) 0 B) $\log\sqrt{5}$ C) 1 D) $\log\frac{1}{5}$ E) $\sqrt{2} \cdot \log\left(\frac{1}{5}\right)$

6. $m^3 = n^2$

$\Rightarrow$ **$\log_n m^2$ = ?**

A) $\frac{3}{4}$ B) $\frac{4}{3}$ C) $\frac{1}{6}$ D) 6 E) 3

7. $\log_3 5 = x$

$\Rightarrow$ **$\log_5 15$ = ?**

A) $\frac{4x}{3}$ B) $\frac{x+3}{x}$ C) $\frac{x}{x+3}$ D) $\frac{x+1}{x}$ E) $\frac{x}{x+1}$

8. $\log(a + b) = \log a + \log b$

$\Rightarrow$ **b = ?**

A) $\frac{a}{a+1}$ B) $\frac{a+1}{a}$ C) $\frac{a}{a-1}$ D) $\frac{a-1}{a}$ E) $\frac{a+1}{a-1}$

9. $\ln(x \cdot y) = 2a$

$\ln\left(\frac{x}{y}\right) = 2b$

$\Rightarrow$ $y = ?$

A) e^{a-b} B) e^{a+b} C) e^{ab} D) e^{a} E) e^{b}

10. $e^x = 1 + \frac{x}{1!} + \frac{x^2}{2!} + \frac{x^3}{3!} + \ldots \frac{x^n}{n!}$

$\Rightarrow \sum_{k=0}^{n} \frac{2^n}{n!} = ?$

A) e B) e^2 C) e^k D) e^n E) $e^{n!}$

11. $\sum_{k=1}^{5} k^2 + \sum_{n=-12}^{-6} n^2 = ?$

A) 640 B) 645 C) 650 D) 655 E) 660

12. $f(x) = 4x + 1$

$x_1 = 4$

$x_2 = 3$

$\Rightarrow \sum_{i=1}^{2} (x_i - 2) \cdot f(x_i) = ?$

A) 47 B) 46 C) 45 D) 19 E) – 5

13. $\prod_{k=1}^{100} \left(7 - \frac{35}{k}\right) = ?$

A) 100! B) 100 C) 10 D) 10! E) 0

14. $\sum_{k=0}^{\infty} \frac{1}{3^{2k}} = ?$

A) $\frac{8}{9}$ B) $\frac{2}{3}$ C) $\frac{3}{2}$ D) 1 E) $\frac{9}{8}$

15. $\left(\prod_{k=1}^{8} k\right) \cdot \left(\prod_{m=-13}^{-9} m\right) = ?$

A) 8! B) 9! C) 13! D) – 13! E) – 9!

16. $9 + \sum_{k=3}^{10} (2k + 1) = ?$

A) 100 B) 112 C) 121 D) 144 E) 169

1-A 2-E 3-C 4-D 5-C 6-B 7-D 8-C 9-A 10-B 11-C 12-A 13-E 14-E 15-D 16-C

ÜNİTE 9

Unit 9

Diziler ve Seriler / Sequences and Series

1. $(a_n) = \left(\sqrt{n+4} - \sqrt{n+3}\right)$

$\Rightarrow$ $S_{60} = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

2. (a_n) bir aritmetik dizi (arithmetical sequence)

$S_n = n^2 + n$

$\Rightarrow$ $a_6 = ?$

A) 10 B) 11 C) 12 D) 14 E) 16

3. $\sum_{k=0}^{\infty} (0{,}8)^k + (0{,}9)^k = ?$

A) 7 B) 10 C) 11 D) 14 E) 15

4. (a_n) bir geometrik dizi (geometrical sequence)

$(a_n) = (x,\ x+2,\ x+6, \ldots)$

$\Rightarrow$ $x = ?$

A) 1 B) 2 C) 3 D) 4 E) 8

5. (a_n) bir geometrik dizi (geometrical sequence)

$(a_n) = \left(\frac{5}{3},\ 1,\ \frac{3}{5},\ \frac{9}{25}, \ldots\right)$

$\Rightarrow$ $a_{100} = ?$

A) $\left(\frac{5}{3}\right)^{98}$ B) $\left(\frac{5}{3}\right)^{100}$ C) $\left(\frac{3}{5}\right)^{98}$

D) $\left(\frac{3}{5}\right)^{99}$ E) $\left(\frac{3}{5}\right)^{100}$

6. (a_n) bir aritmetik dizi (arithmetical sequence)

$S_{16} - S_{15} = 40$

$S_6 - S_5 = 10$

$\Rightarrow$ $a_{11} = ?$

A) 8 B) 10 C) 20 D) 25 E) 50

7. $(a_n) = 5^n \cdot n!$

$(b_n) = \frac{a_{n+1}}{a_n}$

$\Rightarrow$ $(b_n) = ?$

A) n! B) 5 . n! C) 5n + 1

D) 5n + 5 E) 5n

8. $(a_n) \in R^+$ geometrik dizi (geometrical sequence)

$a_3 + a_6 = 28$

$a_3 + a_4 = 4$

$\Rightarrow$ **r = ?**

A) 1 B) 2 C) $\frac{5}{2}$ D) 3 E) $\frac{7}{2}$

9. $(a_n) = (-3n^2 + 16n + 4)$

$\Rightarrow$ **max(a_n) = ?**

A) 20 B) 25 C) 26 D) 28 E) 30

10. $a_k \in Q$, Q: Rasyonel sayı (Rational number)

$(a_n) = \left(\sqrt{3}^{\frac{n+8}{n+2}}\right)$

$\Rightarrow$ **k = ?**

A) 1 B) 3 C) 4 D) 5 E) 6

11. $(a_n) = \left(\frac{3n-1}{2n+6}\right)$

$a_k = \frac{7}{8}$

$\Rightarrow$ **k = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

12. Aşağıdakilerden hangisi sabit dizidir?

Which one of the following is constant array?

A) $((-1)^n)$ B) (n!) C) $\left(\cos\frac{n\pi}{2}\right)$

D) (tan nπ) E) (2n + 3)

13. Aşağıdakilerden hangisi aritmetik dizidir?

Which one of the following is arithmetic array?

A) (n^2) B) (n! + 1) C) (sin nπ)

D) (logn) E) (3n – 2)

14. Aşağıdakilerden hangisi geometrik dizidir?

Which one of the following is geometric array?

A) $(2^n + 1)$ B) (6^n) C) (tan n°)

D) 3n + 4 E) $(-1)^n$

1-A 2-C 3-E 4-B 5-C 6-D 7-D 8-D 9-B 10-C 11-A 12-D 13-E 14-B

1. $(a_n) = \left(\frac{3n + 21}{n + 2}\right)$

$a_k \in Z$

$\Rightarrow \sum k = ?$

A) 1 B) 4 C) 17 D) 18 E) 28

2. **Aşağıdakilerden hangisi bir dizinin genel terimi olabilir?**
Which one of the following can be the general term of an array?

A) $\left(\frac{3n}{n-7}\right)$ B) $\left(\frac{2n+5}{n^2-16}\right)$ C) $(\log n)$

D) $\sqrt{n-3}$ E) $(\cot n^\circ)$

3. $(a_n) = \left(\frac{7n - 19}{n + 1}\right)$

dizisinin kaç terimi 5 ten küçüktür?

How many of the array's terms are smaller than 5 ?

A) 10 B) 11 C) 12 D) 13 E) 14

4. $a_n = \log_{n+2}(n + 3)$

$\Rightarrow \prod_{n=1}^{24} a_n = ?$

A) 10 B) 9 C) 6 D) 5 E) 3

5. $a_{n+1} = a_n + 10$

$a_5 = 8$

$\Rightarrow a_{20} = ?$

A) 158 B) 148 C) 138 D) 128 E) 118

6. $(a_n) = \left(\frac{3}{2n + 1}\right)$

dizisinin kaç terimi $\left(\frac{1}{8}, \frac{1}{2}\right)$ **aralığındadır?**

how many of the array's terms are in the interval of $\left(\frac{1}{8}, \frac{1}{2}\right)$?

A) 10 B) 9 C) 8 D) 7 E) 2

7. $a_0 = 1,\ b_0 = 2$

$a_n = 2a_{n-1} + 3b_{n-1}$

$b_n = a_{n-1} - 2b_{n-1}$

$a_2 \equiv x \pmod 3$

$\Rightarrow x = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

8. $F_1 = 1,\ F_2 = 1$

$F_{n+2} = F_n + F_{n+1}$

Fibonacci dizisi (Fibonacci sequence)

$F_k = 34$

$\Rightarrow k = ?$

A) 6 B) 7 C) 8 D) 9 E) 10

9. $a_{n+1} = a_n + n$

$a_1 = 0$

$\Rightarrow$ **a_{20} = ?**

A) 150 B) 160 C) 170 D) 180 E) 190

10. a_n aritmetik dizi (arithmetic sequence)

$a_4 = x - 2y$

$a_{11} = 3x + y$

$\Rightarrow$ **a_{18} = ?**

A) 3x B) 5x + y C) 5x + 4y

D) 3x + 4y E) 3x + 2y

11. $x \geq 2$,

$$\sum_{n=0}^{\infty} \left(\frac{1}{x}\right)^n = 2$$

$\Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 6 E) 8

12. $\sum_{n=1}^{\infty} \frac{2^n + 3^n}{4^n} = ?$

A) 6 B) 4 C) 3 D) $\frac{7}{4}$ E) 1

13. $(a_n) \in R^+$

a_n geometrik dizi (geometrical sequence)

$(a_n) = (\sqrt{11} - \sqrt{2},\ x + 3,\ \sqrt{11} + \sqrt{2}, \ldots)$

$\Rightarrow$ **x = ?**

A) 3 B) 2 C) 1 D) 0 E) – 1

14. a_n geometrik dizi (geometrical sequence)

$S_n = a_1 + a_2 + a_3 + \ldots a_n$

$S_n = 3^{n+1} - 3$

$\Rightarrow$ **r = ?**

A) $\frac{1}{5}$ B) $\frac{1}{4}$ C) 5 D) 4 E) 3

15. $(a_n) = \frac{n+4}{3n-1}$

$b_n = a_{2n+1}$

$\Rightarrow$ **b_3 = ?**

A) $\frac{7}{8}$ B) $\frac{8}{7}$ C) $\frac{11}{20}$ D) $\frac{20}{11}$ E) $\frac{8}{17}$

16. $(a_n) = \frac{1}{n^2 + 3n + 2}$

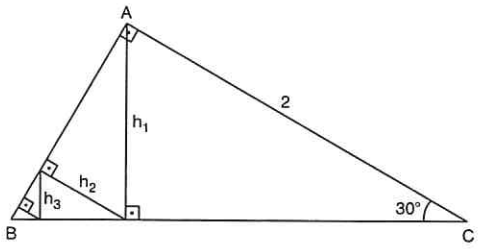
$\Rightarrow$ **S_{10} = ?**

A) $\frac{5}{12}$ B) $\frac{9}{22}$ C) $\frac{10}{11}$ D) $\frac{11}{10}$ E) 10!

1-C 2-C 3-B 4-E 5-A 6-B 7-B 8-D 9-E 10-C 11-A 12-B 13-D 14-E 15-C 16-A

TEST 3

1.



$\Rightarrow$ **$h_1 + h_2 + h_3 + h_4 + \ldots = ?$**

A) 6 B) 5 C) 4 D) 3 E) 2

2. $a_n = \begin{cases} 2n, & n \equiv 0 \pmod 3 \\ n+1, & n \equiv 1 \pmod 3 \\ 1-n^2, & n \equiv 2 \pmod 3 \end{cases}$

$\Rightarrow$ **$(a_{3n-1}) = ?$**

A) $(6n - 2)$ B) $(3n)$ C) $(6n - 9n^2)$
D) $(3n + 2)$ E) $(1 + 6n - 9n^2)$

3. (a_n) bir geometrik dizi (geometrical sequence)

$(a_n) = (-3,\ a-b,\ a-c,\ 4,\ c-d,\ e-d, \ldots)$

olduğuna göre; a, b, c, d, e sayılarından hangisi en küçüktür?
If $(a_n) = (-3,\ a-b,\ a-c,\ 4,\ c-d,\ e-d, \ldots)$,
Which following letters is the smallest?

A) a B) b C) c D) d E) e

4. $(a_n) = (n^2 - 13n - 30)$

a_n dizisinin kaç terimi negatiftir?
a_n how many terms are negative?

A) 11 B) 12 C) 13 D) 14 E) 15

5. $(a_n) = 6n + 2$

$S_n = a_1 + a_2 + a_3 + \ldots + a_n$

$\Rightarrow$ **$S_n = ?$**

A) $3n^2 + 5n$ B) $3n^2 + n$ C) $n^2 + 6n$
D) $6n^2 + 2n$ E) $3n^2 + n + 1$

6. $\frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} + \frac{1}{42} + \ldots = ?$

A) 2 B) 1 C) $\frac{1}{2}$ D) $\frac{1}{4}$ E) $\frac{1}{12}$

7. $(a_n) = \left(\frac{10n + 8}{5n + k}\right)$

a_n sabit dizi (constant sequences)

$\Rightarrow$ **$k = ?$**

A) 4 B) 5 C) 6 D) 10 E) 16

8. $(a_n) = n^2$

$(b_n) = (n)$

$(p \cdot n + q) = \left(\dfrac{a_n + 5.b_n + 6}{b_n + 2}\right)$

$\Rightarrow$ **p . q = ?**

A) 0 B) 1 C) 2 D) 3 E) 6

9. (a_n) aritmetik dizi (arithmetical sequence)

$\Rightarrow \dfrac{a_5 + a_6 + a_7 + a_8 + a_9}{a_4 + a_{10}} = ?$

A) 1 B) $\frac{3}{2}$ C) $\frac{5}{2}$ D) 3 E) 4

10. (a_n) geometrik dizi (geometrical sequence)

$\Rightarrow \dfrac{a_1 \cdot a_2 \cdot a_3}{(a_2)^3} = ?$

A) $\frac{1}{32}$ B) $\frac{1}{16}$ C) $\frac{1}{4}$ D) $\frac{1}{2}$ E) 1

11. (a_n) bir aritmetik dizi (arithmetical sequence)

$a_7 + a_{22} = 50$

$\Rightarrow$ **S_{28} = ?**

A) 300 B) 500 C) 600 D) 700 E) 1400

12. $(a_n) = (x, y, z, \ldots)$

a_n dizisi hem aritmetik hem de geometrik dizi ise $\frac{x + y}{z}$ oranı kaçtır?

If (a_n) is both a_n arithmetic and a geometric sequence then what is $\frac{x + y}{z}$?

A) 1 B) 2 C) 3 D) 4 E) 5

13. (a_n) bir geometrik dizi (geometrical sequence)

$a_5 = 17$

$a_7 = 68$

$\Rightarrow$ **a_8 = ?**

A) 70 B) 76 C) 100 D) 116 E) 136

14. (a_n) bir aritmetik dizi (arithmetical sequence)

$a_{17} + a_{20} = 30$

$a_{16} + a_{22} = 35$

$\Rightarrow$ **$a_{48} - a_{47}$ = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

1-E 2-C 3-B 4-D 5-A 6-C 7-A 8-D 9-C 10-E 11-D 12-B 13-E 14-A

1. (a_n) bir aritmetik dizi (arithmetical sequence)

$a_1^2 - a_7^2 = 48$

$a_4 = 4$

$\Rightarrow$ **$a_1 = ?$**

A) 27 B) 17 C) 7 D) 6 E) 5

2. Ortak farkı 9 olan bir (a_n) aritmetik dizisinin a_1, a_3 ve a_8 terimleri sırasıyla bir geometrik dizinin ardışık üç terimidir.

Buna göre, aritmetik dizinin 7. terimi kaçtır?

a_n arithmetic array which its common difference is 9 , its a_1, a_2 and a_8 respectively terms are geometric array's 3 terms , according to this ; what is the 7th term of the arithmetic array?

A) 63 B) 64 C) 65 D) 66 E) 67

3. $-(0,2) + (0,2)^2 - (0,2)^3 + \ldots = ?$

A) $-\frac{1}{6}$ B) $-\frac{1}{3}$ C) $-\frac{1}{2}$ D) -1 E) -2

4. $90° < \alpha \leq 180°$

$$\sum_{k=1}^{\infty} \sin^{2k}\alpha = \frac{1}{3}$$

$\Rightarrow$ **$\alpha = ?$**

A) 180° B) 150° C) 130° D) 120° E) 110°

5. Aritmetik bir dizi oluşturan üç sayının toplamı 6 dır. Eğer birinci sayıya 1, ikinci sayıya 2, üçüncü sayıya 5 eklenirse bir geometrik dizi oluşuyor.

Bu üç sayıdan en büyüğü kaç olabilir?

Sum of the 3 numbers which make an arithmetic array is 6, if we add 1 to its 1st , 2 to its 2nd and 5 to its 3rd number it will make a geometric array.

What can be the biggest number among these 3 numbers?

A) 8 B) 7 C) 3 D) 1 E) -3

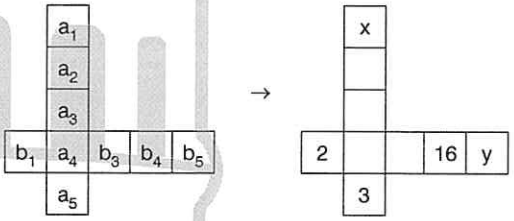
6. (a_n) bir aritmetik dizi (arithmetical sequence)

$a_{n-3} + a_{n-2} + a_{n-1} = 6n + 3$

$\Rightarrow$ **$a_n = ?$**

A) $2n - 5$ B) $2n - 3$ C) $2n - 1$ D) $2n + 3$ E) $2n + 5$

7.



$a_5 - a_4 = a_4 - a_3 = a_3 - a_2 = a_2 - a_1$

$$\frac{b_5}{b_4} = \frac{b_4}{b_3} = \frac{b_3}{a_4} = \frac{a_4}{b_1}$$

$\Rightarrow$ **$x + y = ?$**

A) 35 B) 36 C) 37 D) 38 E) 39

8. Bir geometrik dizide her terim kendinden sonra gelen terimlerin toplamının 3 katına eşittir.

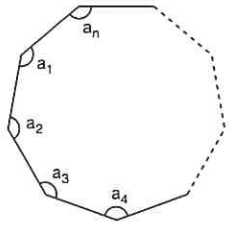
Bu dizinin ilk terimi 4 olduğuna göre, 4. terim kaçtır?

In a geometric array, every single term is equals to the sum of 3x (any x number) that comes after that .

If the 1st term of this array is 4 what will be the 4th term?

A) $\frac{1}{32}$ B) $\frac{1}{16}$ C) $\frac{1}{8}$ D) $\frac{1}{4}$ E) $\frac{1}{2}$

9.



a_n bir aritmetik dizi (arithmetical sequence)

$d = 4°$

$a_n = 130°$

$a_1 = 110°$

$\Rightarrow$ **n = ?**

A) 9 B) 8 C) 7 D) 6 E) 5

10. $(a_n) = (2n + 3)$

$(b_n) = (n + 4)$

$(c_n) = (a_n) - 2(b_n)$

$\Rightarrow$ $c_{1905} = ?$

A) 1905 B) 5 C) 4 D) – 4 E) – 5

11.

1	2	3	4	. . .	n
2	5	8	11	. . .	x
122	120	118	116	. . .	x

$\Rightarrow$ **n = ?**

A) 25 B) 26 C) 27 D) 28 E) 29

12. (a_n) ve (b_n) aritmetik dizi (arithmetical sequence)

$$\frac{\sum_{k=1}^{n} a_k}{\sum_{k=1}^{n} b_k} = \frac{2n + 3}{n + 5}$$

$\Rightarrow$ $\frac{a_5}{b_5} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) 2 E) $\frac{5}{2}$

13. $(a_n) = (-5, -4, -3, -2, \ldots)$

$a_1 + a_2 + a_3 + \ldots a_n = 0$

olduğuna göre, n aşağıdakilerden hangisi olabilir?

Which one of the following can be n?

A) 104 B) 106 C) 1452 D) 1881 E) 11

1-C 2-D 3-A 4-B 5-C 6-E 7-E 8-B 9-D 10-E 11-A 12-C 13-E

1. (a_n) bir aritmetik dizi (arithmetical sequence)

$a_1 = 2n - 4$

$a_2 = 4n - 9$

$a_3 = 5n - 8$

$\Rightarrow$ $a_n = ?$

A) $9n + 1$ B) $8n + 1$ C) $7n + 1$ D) $7n + 2$ E) $7n + 7$

2. $a_1 = 2$

$a_{n+1} = 4n + a_n$

$\Rightarrow$ $a_n = ?$

A) $n^2 + n + 1$ B) $3n^2 - n$ C) $n^2 + 3n$ D) $2n^2 + 2n + 1$ E) $2n^2 - 2n + 2$

3. $(a_n) = \left(\dfrac{2n^2 + 7n - 3}{5n - m}\right)$

olduğuna göre, m aşağıdakilerden hangisi olamaz?
According to (a_n) which of the following numbers could not be "m"?

A) -8 B) -5 C) 3 D) 15 E) 24

4. $a_5 = 7$

$a_{n+1} = n + 2 + a_n$

$\Rightarrow$ $a_n = ?$

A) $\dfrac{n^2 + 3n}{2} - 13$ B) $\dfrac{n^2}{2}$ C) $\dfrac{n^2}{2} + n$ D) $n^2 + 3n + 1$ E) $n^2 + 3n - 1$

5. $\sum_{n=0}^{\infty} (2^{-n} + 3^{-n} + 4^{-n} + \ldots 10^{-n}) = ?$

A) $\sum_{n=1}^{9} \dfrac{n+1}{n}$ B) $\sum_{n=1}^{10} \dfrac{n+1}{n}$ C) $\sum_{n=1}^{10} \dfrac{n+1}{n+1}$ D) $\sum_{n=1}^{9} \dfrac{n}{n+1}$ E) $\sum_{n=1}^{10} \dfrac{n-1}{n}$

6. $|x| < 1$

$A = 1 + x + x^2 + x^3 + \ldots + x^n + \ldots$

$B = 1 - x + x^2 - x^3 + \ldots + (-1)^n x^n + \ldots$

$C = 1 + x^2 + x^4 + x^6 + \ldots + x^{2n} + \ldots$

olduğuna göre, aşağıdakilerden hangisi doğrudur?

A) $A + B = C$ B) $C = A^2 + B^2$ C) $A \cdot B = C$ D) $A \cdot B \cdot C = 1$ E) $A - B = C^2$

7. (a_n) bir aritmetik dizi (arithmetical sequence)

$S_n = a_1 + a_2 + a_3 + \ldots + a_n$

$S_6 = 46$

$a_6 + a_8 = 20$

$\Rightarrow$ $a_1 = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

8. (a_n) bir aritmetik dizi (arithmetical sequence)

$a_a = b$

$a_b = a$

$\Rightarrow$ **r = ?**

A) – 3 B) – 1 C) 0 D) 2 E) 4

9. 1 + a sayısı ile $a^3 + 1$ sayısı arasına a tane terim yerleştirilerek bir aritmetik dizi elde ediliyor.

Ortak fark aşağıdakilerden hangisidir?

When "a" terms are put in between the number "1 + a" and the number "$a^3 + 1$", an arithmetic sequence is abtained.

Which of the following is the common difference of the sequence?

A) $a^2 + a$ B) $a^2 - a$ C) $-a^2 - 1$

D) $a^2 - 1$ E) $a - 1$

10. $a_n = \dfrac{2n + 3}{5n - k}$

$b_n = \dfrac{m \cdot n + 6}{10n + 4}$

$(a_n) = (b_n)$

$\Rightarrow$ **m + k = ?**

A) 6 B) 5 C) 4 D) 2 E) 1

11. $a_n = \begin{cases} 2n + 1 & \text{n tek (odd)} \\ n^2 + 2 & \text{n çift (even)} \end{cases}$

$\Rightarrow$ **$a_{10} - a_5$ = ?**

A) 80 B) 81 C) 91 D) 92 E) 93

12. $a_n = \left(\dfrac{3n - 2}{2n + k}\right)$

$a_5 = 1$

$\Rightarrow$ **k = ?**

A) 3 B) 2 C) 1 D) – 1 E) – 3

13. $a_n = (1,\ 1 + 2,\ 1 + 2 + 3,\ \ldots,\ 1 + 2 + 3 + \ldots + n)$

$\Rightarrow \sum_{n=1}^{10} a_n = ?$

A) 69 B) 79 C) 170 D) 220 E) 222

14. a_n sabit dizi (constant sequences)

$(a_n) = (m - n - 3)n^2 + (m + n - 11)n + 3$

$\Rightarrow$ **$n^2 - m^2$ = ?**

A) 33 B) 11 C) 0 D) – 11 E) – 33

1-C 2-E 3-D 4-A 5-A 6-C 7-D 8-B 9-B 10-D 11-C 12-A 13-D 14-E

1. $(a_n) = (1^2 + 2^2 + 3^2 + \ldots + n^2)$

$\Rightarrow a_4 + a_3 = ?$

A) 30 B) 34 C) 42 D) 43 E) 44

2. a, b, c geometrik dizi (geometrical sequence)

a, 2b, 3c aritmetik dizi (arithmetical sequence)

$a \neq b$,

$\Rightarrow \frac{c}{b} = ?$

A) $\frac{1}{5}$ B) $\frac{1}{3}$ C) 1 D) 3 E) 5

3. $(a_n) = (m - 3n,\ 2mn,\ m \cdot n^2,\ \ldots)$

(a_n) dizisi hem aritmetik hem de geometrik dizi ise m kaçtır?

If (a_n) is bath an arithmetic and a geometric sequence, the what is "m"?

A) – 5 B) – 4 C) – 3 D) – 2 E) – 1

4. $\sum_{n=2}^{\infty} \frac{n}{(n+1)!} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$ E) $\frac{1}{6}$

5. $\sum_{n=1}^{\infty} n \cdot 2^{-n} = ?$

A) $\frac{1}{2}$ B) 1 C) 2 D) 3 E) 4

6. (a_n) aritmetik dizi (arithmetical sequence)

$a_{11} = 3 \cdot \sin^2 58°$

$a_{22} = 3 \cdot \cos^2 58°$

$\Rightarrow S_{32} = ?$

A) 18 B) 20 C) 24 D) 48 E) 96

7. (a_n) geometrik dizi (geometrical sequence)

$a_1 = 2^{10} + 1$

$r = 2$

$\Rightarrow S_{10} = ?$

A) $2^{20} - 1$ B) $2^{20} + 1$ C) 2^{20}

D) $2^{10} - 1$ E) $2^{10} + 1$

8. $(x^2 - 4x + 3) \cdot (x - a) = 0$

denkleminin kökleri bir geometrik dizi oluşturduğuna göre, a kaç olabilir?

Find a if the roots of the equation form a geometric sequence

A) – 9 B) – 6 C) – 2 D) 6 E) 9

9. $\sum_{k=-\infty}^{2} \left(\frac{4}{3}\right)^k = ?$

A) $\frac{128}{9}$ B) $\frac{64}{9}$ C) $\frac{32}{9}$ D) $\frac{16}{9}$ E) $\frac{8}{9}$

10. (a_n) aritmetik dizi (arithmetical sequence)

$3a_{2x} = 4 - 3a_{2y}$

$\Rightarrow$ $\mathbf{a_{x+y} = ?}$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $\frac{4}{3}$ E) 2

11. (a_n) geometrik dizi (geometrical sequence)

$a_1 = a$

$S_n = b$

$a_2 = a_1 \cdot r$

$\Rightarrow$ $\mathbf{1 + r + r^2 + r^3 + \ldots + r^{n-1} = ?}$

A) a . b B) a – b C) b – a D) $\frac{a}{b}$ E) $\frac{b}{a}$

12. (a_n) geometrik dizi (geometrical sequence)

$a_1 = 1$

$r = 2$

$\sum_{k=n-2}^{n} a_k = 64 \cdot \sum_{k=1}^{3} a_k$

$\Rightarrow$ $\mathbf{n = ?}$

A) 9 B) 10 C) 11 D) 12 E) 13

13. (a_n) aritmetik dizi (arithmetical sequence)

$a_1 + a_4 + a_7 + \ldots + a_{16} = 147$

$\Rightarrow$ $\mathbf{a_1 + a_6 + a_{11} + a_{16} = ?}$

A) 36 B) 49 C) 67 D) 98 E) 147

14. (a_n) aritmetik dizi (arithmetical sequence)

$(a_3)^2 - (a_1)^2 = a_2$

$\Rightarrow$ $\mathbf{r = ?}$

A) 2 B) 3 C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

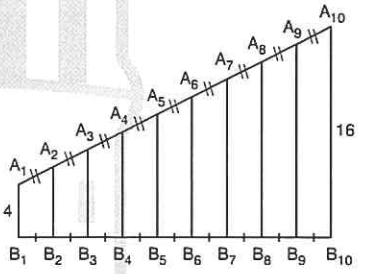
15. $(a_n) = \left(\frac{(m-3)n^2 + 2n + p}{(m+1).n + 12}\right)$

(a_n) sabit dizi (constant sequence)

$\Rightarrow$ $\mathbf{p = ?}$

A) 3 B) 4 C) 6 D) 10 E) 12

16.



$\Rightarrow$ $\mathbf{|A_1B_1| + |A_2B_2| + |A_3B_3| + \ldots + |A_{10}B_{10}| = ?}$

A) 100 B) 120 C) 140 D) 160 E) 180

1-E 2-B 3-D 4-A 5-C 6-D 7-A 8-E 9-B 10-B 11-E 12-A 13-D 14-E 15-C 16-A

ÜNİTE 10

Unit 10

Matris / Matrix

TEST 1

1. $\begin{bmatrix} 1 & 2 & 3 & 4 \\ 2 & 4 & 6 & 8 \end{bmatrix}_{a \times b}$

$\Rightarrow$ **a + b = ?**

A) 8 B) 6 C) 4 D) 3 E) 2

2. $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}_{3 \times 3}$

$\Rightarrow$ **$a_{11} + a_{22} + a_{33}$ = ?**

A) 10 B) 11 C) 12 D) 13 E) 14

3. $I = \begin{bmatrix} x-5 & 0 & 0 \\ 0 & y-1 & 0 \\ 0 & 0 & z-3 \end{bmatrix}_{3 \times 3}$

$\Rightarrow$ **x + y − z = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

4. $A = \begin{bmatrix} a-b & a^2+ab+b^2 \\ 5 & 2 \end{bmatrix}_{2 \times 2}$

$B = \begin{bmatrix} 5 & 12 \\ x+y & x-y \end{bmatrix}_{2 \times 2}$

A = B

$\Rightarrow$ $\dfrac{b^3 - a^3}{x^2 - y^2}$ = ?

A) 6 B) 5 C) 0 D) − 6 E) − 5

5. $A = \begin{bmatrix} \cdots & \cdots \\ \cdots & \cdots \end{bmatrix}_{4 \times 5}$

$B = \begin{bmatrix} \cdots & \cdots \\ \cdots & \cdots \end{bmatrix}_{a \times b}$

$C = \begin{bmatrix} \cdots & \cdots \\ \cdots & \cdots \end{bmatrix}_{c \times 7}$

A . B = C

$\Rightarrow$ **a − b + c = ?**

A) 4 B) 3 C) 2 D) 1 E) 0

6. $A = \begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}_{2 \times 2}$

$\Rightarrow$ **A^{-1} = ?**

A) $\begin{bmatrix} 2 & -5 \\ -1 & 3 \end{bmatrix}$ B) $\begin{bmatrix} -2 & 5 \\ 1 & -3 \end{bmatrix}$ C) $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$

D) $\begin{bmatrix} -3 & 1 \\ 5 & -2 \end{bmatrix}$ E) $\begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix}$

7. $A = \begin{bmatrix} 1 & 5 \\ 0 & 1 \end{bmatrix}$

$\Rightarrow$ **A^{12} = ?**

A) $\begin{bmatrix} 1 & 5^{12} \\ 0 & 1 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 5 & 1 \\ 1 & 0 \end{bmatrix}$

D) $\begin{bmatrix} 1 & 60 \\ 0 & 1 \end{bmatrix}$ E) $\begin{bmatrix} 60 & 1 \\ 1 & 0 \end{bmatrix}$

8. $f(x) = x^2 - 5$

$A = \begin{bmatrix} 1 & 3 \\ 2 & -1 \end{bmatrix}_{2 \times 2}$

$\Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} -4 & 4 \\ -1 & -4 \end{bmatrix}$ B) $\begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

D) $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ E) $\begin{bmatrix} 4 & 4 \\ 1 & 1 \end{bmatrix}$

9. $\begin{vmatrix} 2 & 1 \\ 4 & 5 \end{vmatrix} = ?$

A) 3 B) 5 C) 6 D) – 6 E) – 5

10. $A = \begin{bmatrix} x+1 & x+3 \\ x+2 & x \end{bmatrix}$

$\det(A) = -26$

$\Rightarrow$ **x = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

11. $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & x & 1 \\ 3 & 0 & 1 \end{bmatrix}_{3\times 3}$

$|A| = -2$

$\Rightarrow$ **x = ?**

A) – 1 B) 0 C) 1 D) 2 E) 3

12. $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

$\Rightarrow$ **M_{11} = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

13. $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

$\Rightarrow$ **A_{12} = ?**

A) – 4 B) – 3 C) – 2 D) 2 E) 3

14. $\begin{vmatrix} \log_3 256 & 8 \\ x & \log_2 9 \end{vmatrix} = 0$

$\Rightarrow$ **x = ?**

A) 2 B) 3 C) 4 D) 5 E) 6

15. $f(x) = \begin{vmatrix} \cos x & \sin x \\ \sin x & \cos x \end{vmatrix} \cdot \begin{vmatrix} \sin x & -\sin x \\ \cos & \cos x \end{vmatrix}$

$\Rightarrow$ **$f\left(\frac{\pi}{8}\right)$ = ?**

A) $\frac{1}{2}$ B) 1 C) $\frac{\sqrt{2}}{2}$ D) $\frac{\sqrt{3}}{2}$ E) 0

16. $f(x) = \begin{vmatrix} x+2 & x \\ 4x & 5x-6 \end{vmatrix}$

$\Rightarrow$ **$\min(f(x))$ = ?**

A) 16 B) 14 C) 0 D) – 14 E) – 16

1-B 2-E 3-A 4-D 5-C 6-A 7-D 8-B 9-C 10-E 11-D 12-B 13-B 14-A 15-A 16-E

1. $A = \begin{bmatrix} 1 & x \\ x & 2 \end{bmatrix}$

$f(x) = \det(A + a \cdot I_2)$ fonksiyonunun çarpanlarından birisi x olduğuna göre, a kaç olabilir?

If one of the function's multipliers is x then what a can be?

A) -2 B) $-\frac{1}{2}$ C) 0 D) $\frac{1}{2}$ E) 3

2. $A = \begin{bmatrix} 1 \\ 2 \\ 3 \\ \vdots \\ 10 \end{bmatrix}_{10 \times 1}$

olduğuna göre, $A \cdot A^T$ matrisinin asal köşegenindeki elemanların toplamı kaçtır?

According to the given information

what is the sum of elements in the prime corner of $A \cdot A^T$ matrix?

A) 250 B) 270 C) 310 D) 340 E) 385

3. $P(x) = \begin{vmatrix} x^2 & -1 & -1 \\ -1 & x^2 & -1 \\ -1 & -1 & x^2 \end{vmatrix}$

P(x) polinomunun $x^2 + 1$ ile bölümünden kalan kaçtır?

What is the remainder of the polynomial P(x) dividing by $x^2 + 1$?

A) -3 B) -2 C) 0 D) 1 E) 5

4. $A = \begin{bmatrix} \sin\theta & \cos\theta \\ 1 & -1 \end{bmatrix}$

$B = \begin{bmatrix} \cos\theta & 1 \\ \sin\theta & 1 \end{bmatrix}$

⇒ **$\det(A \cdot B) = ?$**

A) 0 B) $\sin2\theta$ C) $-\sin2\theta$ D) $\cos2\theta$ E) $-\cos2\theta$

5. $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & k \end{vmatrix} = -16$

⇒ $\begin{vmatrix} \mathbf{c} & \mathbf{b} & \mathbf{a} \\ \mathbf{f} & \mathbf{e} & \mathbf{d} \\ \mathbf{k} & \mathbf{h} & \mathbf{g} \end{vmatrix} = ?$

A) -16 B) -4 C) 4 D) 8 E) 16

6. $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$A^2 = \begin{bmatrix} x & y \\ z & t \end{bmatrix}$

$a + b = c + d = a + c = b + d = 6$

⇒ **$x + y + z + t = ?$**

A) 12 B) 24 C) 40 D) 72 E) 144

7. $0 < \alpha < \frac{\pi}{2}$

$0 < \beta < \frac{\pi}{2}$

$\begin{vmatrix} \cos\alpha & \sin\alpha \\ \sin\beta & \cos\beta \end{vmatrix} = 0$

$\Rightarrow \alpha + \beta = ?$

A) 30° B) 45° C) 60° D) 90° E) 135°

8. A, B, C kare matris (square matrix)

$A^T . B^{-1} = C$

$\Rightarrow$ **$B^T . C^T = ?$**

A) $-A$ B) A^{-1} C) A^T D) A E) $-A^T$

9. $A = \begin{bmatrix} 3 & a \\ b & c \end{bmatrix}$

$|A + I_2| = |A| + |I_2|$

$\Rightarrow$ **$c = ?$**

A) -5 B) -4 C) -3 D) -2 E) 2

10. $[A]_{2\times 2}$

$\begin{bmatrix} a & b \\ c & d \end{bmatrix} . A = \begin{bmatrix} b & a \\ d & c \end{bmatrix}$

$\Rightarrow$ **$A = ?$**

A) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$ B) $\begin{bmatrix} -1 & 0 \\ 1 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$

D) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ E) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

11. $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = \begin{vmatrix} a-1 & b-1 \\ c+1 & d+1 \end{vmatrix}$

olduğuna göre, aşağıdakilerden hangisi doğrudur?

Which of the following is correct?

A) $a . c = b . d$ B) $a = b$ C) $a + b = c + d$

D) $c = d$ E) $a + c = b + d$

12. $i^2 = -1$

$A = [i \quad -1 \quad -i]_{1\times 3}$

$\Rightarrow$ **$A . A^T = ?$**

A) I B) A^T C) $-A$ D) $[-1]$ E) $[i]$

13. $x + 3y = 5$

$2x - 7y = 2$

Aşağıdakilerden hangisi doğrudur?

Which of the following is correct?

A) $\begin{bmatrix} 1 & 2 \\ 3 & -7 \end{bmatrix} . \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 2 \end{bmatrix}$ B) $\begin{bmatrix} 1 & 3 \\ 2 & 7 \end{bmatrix} . \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 2 \end{bmatrix}$

C) $\begin{bmatrix} 4 \\ -5 \end{bmatrix} . \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 2 \end{bmatrix}$ D) $\begin{bmatrix} 1 & 3 \\ 2 & -7 \end{bmatrix} . \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 2 \end{bmatrix}$

E) $[1 \quad 2] . [x \quad y] = [5 \quad 2]$

14. $[A]_{3\times 3}$

$[B]_{2\times 2}$

$\det(A) = 4$

$\det(B) = 3$

$\Rightarrow$ **$\det(2A) + \det(4B) = ?$**

A) 50 B) 60 C) 80 D) 100 E) 120

1-A 2-E 3-C 4-E 5-E 6-D 7-D 8-D 9-C 10-E 11-E 12-D 13-D 14-C

TEST 3

1. $B^T \cdot A^T = \begin{bmatrix} -2 & 1 \\ 3 & 2 \end{bmatrix}$

$\Rightarrow$ **A . B = ?**

A) $\begin{bmatrix} 1 & -2 \\ 3 & 2 \end{bmatrix}$ B) $\begin{bmatrix} 2 & 3 \\ 1 & -2 \end{bmatrix}$ C) $\begin{bmatrix} -2 & 3 \\ 1 & 2 \end{bmatrix}$

D) $\begin{bmatrix} -2 & 1 \\ 3 & 2 \end{bmatrix}$ E) $\begin{bmatrix} 3 & 2 \\ -2 & 1 \end{bmatrix}$

2. $A = \begin{bmatrix} -1 & 3 & 4 \\ 2 & m & -8 \\ 0 & 3 & 5 \end{bmatrix}$

matrisinin tersi yoksa m kaça eşittir?

If there is no inverse matrix then what is the value of "m"?

A) – 6 B) – 3 C) 0 D) 3 E) 6

3. $f\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \left(\begin{bmatrix} -x \\ 2y \end{bmatrix}\right)$

$g\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \left(\begin{bmatrix} x \\ -y \end{bmatrix}\right)$

$\Rightarrow$ **(2f – g)** $\left(\begin{bmatrix} -1 \\ 1 \end{bmatrix}\right)$ **= ?**

A) $\begin{bmatrix} -2 \\ 3 \end{bmatrix}$ B) $\begin{bmatrix} -3 \\ 3 \end{bmatrix}$ C) $\begin{bmatrix} 3 \\ -3 \end{bmatrix}$

D) $\begin{bmatrix} 3 \\ 5 \end{bmatrix}$ E) $\begin{bmatrix} 5 \\ 3 \end{bmatrix}$

4. $\begin{bmatrix} 3 & a \\ 2 & a+1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ x \end{bmatrix} = \begin{bmatrix} -1 \\ 2 \end{bmatrix}$

$\Rightarrow$ **a = ?**

A) 2 B) 1 C) 0 D) $\frac{1}{2}$ E) – 1

5. $A = \begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}$

$A^n = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$c + d = 52$

$\Rightarrow$ **n = ?**

A) 10 B) 15 C) 16 D) 17 E) 18

6. $M = \begin{bmatrix} 1 & 2 \\ 1 & -1 \end{bmatrix}$

$N = [a_{ij}]_{2 \times 2}$

$M \cdot N = M - N$

$\Rightarrow$ **det(N) = ?**

A) 3 B) 2 C) 6 D) $\frac{1}{2}$ E) $\frac{3}{2}$

7. $A = \begin{bmatrix} 0 & 1 \\ 2 & -1 \\ -2 & 0 \\ 3 & 4 \end{bmatrix} \cdot \begin{bmatrix} 3 & -1 & 0 \\ 1 & 4 & 5 \end{bmatrix}$

$\Rightarrow$ **$a_{42} - a_{31}$ = ?**

A) 22 B) 21 C) 20 D) 19 E) 18

8. $\begin{vmatrix} \sin 110° & \sin 40° \\ \cos 70° & \cos 40° \end{vmatrix}$ **= ?**

A) $\frac{\sqrt{3}}{2}$ B) $-\frac{\sqrt{3}}{2}$ C) $\frac{1}{2}$ D) $-\frac{1}{2}$ E) 1

9. $x^2 - 5x + 2 = 0$

S. S. = {a, b}

$A = \begin{bmatrix} a & 1 \\ 1 & b \end{bmatrix}$

$B = \begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

$A \,.\, B \,.\, A = \begin{bmatrix} x & y \\ z & t \end{bmatrix}$

$\Rightarrow$ **x + y + z + t = ?**

A) 16 B) 15 C) 14 D) 12 E) 0

10. $2A - 3B = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$

$2B - 3A = \begin{bmatrix} 1 & 2 \\ 3 & 1 \end{bmatrix}$

$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$\Rightarrow$ **a + b + c + d = ?**

A) – 7 B) – 5 C) – 3 D) – 1 E) 1

11. $A = \begin{bmatrix} x & 1 \\ y & -1 \end{bmatrix}_{2x2}$

$A^2 = A \,.\, A^{-1}$

$\Rightarrow$ **x . y = ?**

A) 2 B) 1 C) 0 D) – 2 E) – 1

12. $A = \begin{bmatrix} 1 & 0 \\ 2 & -1 \end{bmatrix}$

$\Rightarrow$ $A^{101} = ?$

A) A^2 B) A^T C) A^{-1} D) 2A E) 4A

13. $A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}$

$A^n = \begin{bmatrix} x_1 & x_2 \\ x_3 & x_4 \end{bmatrix}$

$\Rightarrow \sum_{k=1}^{4} x_k = ?$

A) n^2 B) n C) $n^2 + 3$ D) n + 2 E) n + 3

14. $\begin{bmatrix} 3 & 2 \\ 0 & -3 \end{bmatrix}^{2007} = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$\Rightarrow$ **a + b + c + d = ?**

A) $2 \,.\, 3^{2007}$ B) 3^{2007} C) $2 \,.\, 3^{2006}$

D) 3^{2006} E) 0

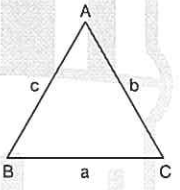
15. $\begin{vmatrix} x & y \\ x+1 & y-1 \end{vmatrix} = m$

$\Rightarrow \begin{vmatrix} \mathbf{x+2} & \mathbf{y+2} \\ \mathbf{x+3} & \mathbf{y+1} \end{vmatrix} = ?$

A) m – 4 B) m – 2 C) m

D) m + 2 E) m + 4

16.



$\Rightarrow \begin{vmatrix} \mathbf{a} & \mathbf{b} & \mathbf{c} \\ \mathbf{3} & \mathbf{4} & \mathbf{5} \\ \mathbf{sinA} & \mathbf{sinB} & \mathbf{sinC} \end{vmatrix} = ?$

A) 60 B) 20 C) 12 D) 0 E) – 1

1-C 2-A 3-D 4-E 5-D 6-C 7-D 8-C 9-A 10-A 11-C 12-C 13-D 14-C 15-C 16-D

TEST 4

1. $a + b = 1$

$$\Rightarrow \begin{vmatrix} a & b & -1 \\ b & -1 & a \\ -1 & a & b \end{vmatrix} = ?$$

A) 0 B) 1 C) 3 D) 8 E) 18

2. $A = \begin{bmatrix} 1 & 1 & 1 \\ a & b & c \\ x & y & z \end{bmatrix}$

$$B = \begin{bmatrix} -2 & -2 & -2 \\ 2x & 2y & 2z \\ a-1 & b-1 & c-1 \end{bmatrix}$$

$\det(A) + \det(B) = 20$

$\Rightarrow$ **det(2A) = ?**

A) 8 B) 32 C) 40 D) 80 E) 160

3. $\begin{vmatrix} 1 & 1 & 1 \\ a & b & c \\ x & y & z \end{vmatrix} = p$

$$\Rightarrow \begin{vmatrix} 1 & 1 & 1 \\ a-1 & b-1 & c-1 \\ x-2 & y-2 & z-2 \end{vmatrix} = ?$$

A) p^2 B) $p - 3$ C) $p - 1$ D) p E) 0

4. $\begin{vmatrix} 1 & 2 & 3 \\ x & y & z \\ a & b & c \end{vmatrix} = -4$

$$\Rightarrow \begin{vmatrix} 2 & 2 & -3 \\ y & 2x & -z \\ b & 2a & -c \end{vmatrix} = ?$$

A) -8 B) -4 C) 4 D) 8 E) 16

5. $\begin{vmatrix} 3 & 2x & x^2 \\ 1 & 2 & 3 \\ 9 & 6 & 3 \end{vmatrix} = 0$

$\Rightarrow$ **S. S. = ?**

A) $\{1, 2\}$ B) $\{2, 3\}$ C) $\{1, 3\}$ D) $\{-1, 3\}$ E) $\{-3, 1\}$

6. $A = \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}_{3\times1}$

$B = [3 \;\; 5 \;\; 7]_{1\times3}$

$\Rightarrow$ **$A^T + B$ = ?**

A) $[3 \;\; 10 \;\; 21]_{1\times3}$ B) $[4 \;\; 7 \;\; 10]_{3\times1}$ C) $[4 \;\; 7 \;\; 10]_{1\times3}$ D) $[3 \;\; 5 \;\; 10]_{1\times3}$ E) $[1 \;\; 2 \;\; 3]_{3\times1}$

7. $A = \begin{bmatrix} 5 & 3 \\ 3 & x \end{bmatrix}$

$$A^{-1} = \begin{bmatrix} 2 & -3 \\ -3 & 5 \end{bmatrix}$$

$\Rightarrow$ **x = ?**

A) -2 B) -1 C) 0 D) 1 E) 2

8. $A = [a_{ij}]_{(m-1)\times 2}$

$B = [b_{jk}]_{(n+1)\times(p+2)}$

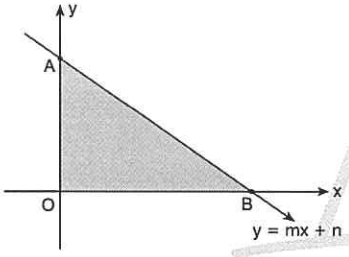
$C = [c_{ik}]_{4\times 3}$

$A \cdot B = C$

⇒ **m + n + p = ?**

A) 8 B) 7 C) 6 D) 5 E) 4

9. $\begin{vmatrix} x & y & 1 \\ -3 & 4 & 1 \\ 2 & 0 & 1 \end{vmatrix} = 0$



⇒ **A(AOB) = ?**

A) 0,2 B) 0,4 C) 0,8 D) 1,6 E) 3,2

10. f: R → B

$f(x) = \begin{vmatrix} 2x & x+1 \\ x-1 & x-2 \end{vmatrix}$

⇒ **B = ?**

A) (0, 4) B) $[-3, 0)$ C) $[-2, 2)$

D) $[-2, \infty)$ E) $[-3, \infty)$

11. $A = [a_{ij}]_{3\times 3}$

$a_{ij} = \begin{cases} j - i & i < j \\ i - j & i \geq j \end{cases}$

⇒ **det(A) = ?**

A) – 5 B) 1 C) 3 D) 4 E) 5

12. $M - 2 \cdot \begin{bmatrix} 1 & 0 \\ 1 & -1 \end{bmatrix} + 3 = 0$

⇒ **M = ?**

A) $\begin{bmatrix} -1 & 0 \\ 2 & -5 \end{bmatrix}$ B) $\begin{bmatrix} -1 & 0 \\ -5 & 2 \end{bmatrix}$ C) $\begin{bmatrix} 0 & -1 \\ 2 & -5 \end{bmatrix}$

D) $\begin{bmatrix} 0 & -1 \\ -5 & 2 \end{bmatrix}$ E) $\begin{bmatrix} -1 & 0 \\ -2 & 5 \end{bmatrix}$

13. $f(x) = 3x + 2$

$A = \begin{bmatrix} 1 & 0 & -1 \\ 1 & 1 & 2 \\ 0 & 2 & 3 \end{bmatrix}$

⇒ **det(f(A)) = ?**

A) 43 B) 42 C) 41 D) 40 E) 39

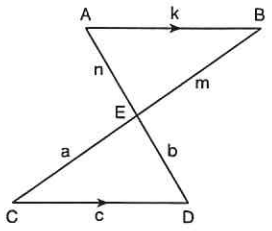
14. $\begin{vmatrix} 1 & a & 2 \\ 1 & b & x \\ 1 & c & 5 \end{vmatrix} = \begin{vmatrix} 1 & a & 5 \\ 1 & b & 10 \\ 1 & c & 8 \end{vmatrix}$

⇒ **x = ?**

A) 3 B) 4 C) 5 D) 6 E) 7

1-A 2-B 3-D 4-A 5-C 6-C 7-E 8-B 9-D 10-E 11-D 12-A 13-C 14-E

1.



$[AB] // [DC]$ $\quad [AD] \cap [BC] = \{E\}$

$$\Rightarrow \begin{vmatrix} a & b & c \\ m & n & k \\ 7 & 24 & 25 \end{vmatrix} = ?$$

A) 50 B) 25 C) 24 D) 7 E) 0

2. $A = [a_{ij}]_{m \times m}$

$B^T = A^T + A$

$\Rightarrow$ **B = ?**

A) B^{-1} B) $A + B$ C) A^{-1} D) B^T E) A

3.

$$\begin{vmatrix} -1 & -1 & 2 & 1 \\ 0 & 3 & -1 & 0 \\ 2 & 0 & 1 & 3 \\ 0 & 1 & 4 & 2 \end{vmatrix} = ?$$

A) 39 B) 33 C) 23 D) 11 E) 0

4. $4 \cdot \begin{bmatrix} x \\ y \end{bmatrix} - 5 \cdot \begin{bmatrix} y \\ x \end{bmatrix} = \begin{bmatrix} 9 \\ -9 \end{bmatrix}$

$\Rightarrow$ **x = ?**

A) – 1 B) 0 C) 1 D) 2 E) 3

5. $i^2 = -1$

$$\Rightarrow \begin{bmatrix} i & i^2 & i^3 \end{bmatrix}_{1 \times 3} \cdot \begin{bmatrix} i^8 \\ i^7 \\ i^6 \end{bmatrix}_{3 \times 1} = ?$$

A) $[3]_{1 \times 1}$ B) $[3i]_{1 \times 1}$ C) $[0]_{1 \times 1}$ D) 3 E) 3i

6.

$$\Rightarrow \begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} . \begin{bmatrix} 1 & 2 & 3 \end{bmatrix} = ?$$

A) $[14]_{1 \times 1}$ B) $[1 \ 2 \ 3]_{1 \times 3}$ C) $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix}_{3 \times 1}$

D) $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 6 \\ 3 & 6 & 9 \end{bmatrix}_{3 \times 3}$ E) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}_{3 \times 3}$

7. $A = \begin{bmatrix} 2 & 1 \\ 0 & -2 \end{bmatrix}$

$f(x) = x^2 + 3x + 4$

$\Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} 14 & 3 \\ 0 & 2 \end{bmatrix}$ B) $\begin{bmatrix} 11 & 3 \\ 0 & 2 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 3 \\ 0 & 2 \end{bmatrix}$

D) $\begin{bmatrix} 3 & 1 \\ 2 & 0 \end{bmatrix}$ E) $\begin{bmatrix} 3 & 1 \\ 0 & 2 \end{bmatrix}$

8. $\begin{vmatrix} 1376 & 1375 \\ 1375 & 1376 \end{vmatrix} = ?$

A) 0 B) 1375 C) 1376 D) 2751 E) 3111

9. $\begin{vmatrix} 2020 & 2010 \\ 2030 & 2020 \end{vmatrix} = ?$

A) 120 B) 110 C) 100 D) 80 E) 0

10. $A = \begin{bmatrix} m & \frac{1}{3} \\ \frac{1}{6} & n \end{bmatrix}$

$A = A^{-1}$

$\Rightarrow \frac{m}{n} = ?$

A) $\frac{1}{2}$ B) 1 C) $\frac{\sqrt{13}}{5}$ D) 6 E) -1

11. $A = \begin{bmatrix} 1 & 0 \\ -1 & 1 \end{bmatrix}$

$B = \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$

$A \cdot x = B$

$\Rightarrow x = ?$

A) $\begin{bmatrix} 1 & 0 \\ 2 & 1 \end{bmatrix}$ B) $\begin{bmatrix} 0 & 0 \\ 1 & 1 \end{bmatrix}$ C) $\begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix}$

D) $\begin{bmatrix} 1 & 1 \\ 0 & 0 \end{bmatrix}$ E) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

12. $A = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$

$B = \begin{bmatrix} 1 & 0 \\ 5 & 1 \end{bmatrix}$

$\Rightarrow \det(A^2 - B^2) = ?$

A) 80 B) 70 C) 60 D) -60 E) -70

13. $\begin{bmatrix} 1 & 2 \\ -1 & 3 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 1 \\ 9 \end{bmatrix}$

$\Rightarrow x \cdot y = ?$

A) -2 B) -3 C) -5 D) -6 E) -7

14. $x, y, z \in R^+$

$$\begin{bmatrix} x & y \\ 0 & z \end{bmatrix} \cdot \begin{bmatrix} x & y \\ 0 & z \end{bmatrix} = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}$$

$\Rightarrow \frac{x+y}{z} = ?$

A) $\frac{1}{6}$ B) $\frac{2}{6}$ C) $\frac{3}{6}$ D) $\frac{10}{3}$ E) $\frac{5}{6}$

15. $[2 \quad 1] \cdot \begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}^{-1} \cdot \begin{bmatrix} 1 \\ m \end{bmatrix} = [3]$

$\Rightarrow m = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

16. $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

$B = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$

$(2A - B) \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 5 \\ 8 \end{bmatrix}$

olduğuna göre, aşağıdakilerden hangisi doğrudur?

Which of the following is correct?

A) $2x - y = 5$, $3x - y = 8$ B) $x - y = 5$, $x + y = 8$ C) $2x + y = 5$, $3x + y = 8$

D) $x + 2y = 5$, $4x + 7y = 8$ E) $x - 2y = 5$, $4x - 7y = 8$

1-E 2-D 3-A 4-C 5-B 6-D 7-A 8-D 9-C 10-E 11-A 12-C 13-D 14-E 15-B 16-D

TEST 6

1. $I_{2\times 2} = \begin{bmatrix} \log_5 a & 0 \\ 0 & (b-2)^2 \end{bmatrix}$

$\Rightarrow \sum a \cdot b = ?$

A) 2 B) 8 C) 20 D) 22 E) 24

2. $A = \begin{bmatrix} 1 & n \\ 0 & 1 \end{bmatrix}$

$A^2 + A^3 = \begin{bmatrix} 2 & 30 \\ 0 & 2 \end{bmatrix}$

$\Rightarrow n = ?$

A) 6 B) 7 C) 8 D) 9 E) 10

3. $A = \begin{bmatrix} 3 & 2 \\ 0 & -3 \end{bmatrix}$

$I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$\Rightarrow A^{2020} = ?$

A) 3^{1010} B) $9^{1010} \cdot I$ C) I

D) $9^{2020} \cdot I$ E) $9^{4040} \cdot I$

4. $\begin{vmatrix} m & n \\ k & x \end{vmatrix} = \begin{vmatrix} m+p & n+p \\ k+p & x+p \end{vmatrix}$

$\Rightarrow x = ?$

A) $m + n - k$ B) $n + k - m$ C) $k + m - n$

D) $m + n + k$ E) $-m - n - k$

5. $\begin{bmatrix} 1 & -1 \\ 2 & 1 \\ -1 & 2 \end{bmatrix} \cdot \begin{bmatrix} 1 & 6 & 4 \\ 3 & 1 & 5 \end{bmatrix} = \begin{bmatrix} a & \bullet & \bullet \\ \bullet & b & \bullet \\ \bullet & \bullet & c \end{bmatrix}$

$\Rightarrow a + b + c = ?$

A) 13 B) 14 C) 15 D) 16 E) 17

6. $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$

$\Rightarrow |A - A^T| = ?$

A) 5 B) 4 C) 3 D) 1 E) -1

7. $[1 \quad 2 \quad 3] \cdot A = [0 \quad 1 \quad 1]$

$[1 \quad 4 \quad 0] \cdot A = [5 \quad 2 \quad 1]$

$\Rightarrow [3 \quad 8 \quad 6] \cdot A = ?$

A) $[1 \quad 2 \quad 3]$ B) $[2 \quad 4 \quad 6]$ C) $[7 \quad 4 \quad 3]$

D) $[5 \quad 4 \quad 3]$ E) $[5 \quad 4 \quad 2]$

8. $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$

$I = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$A^2 = \begin{bmatrix} 3 & 2 \\ 2 & 4 \end{bmatrix}$

$\Rightarrow \det[(A - I) \cdot (A + I)] = ?$

A) 1 B) 2 C) 3 D) -1 E) -2

9. $A = \begin{bmatrix} 1 & 0 \\ -1 & 2 \end{bmatrix}$

$B = \begin{bmatrix} -1 & 1 \\ 0 & n \end{bmatrix}$

$\det(A + B) = \det(A) + \det(B) = ?$

$\Rightarrow$ **n = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

10. $5x - 3y = 19$

$2x + 6y = 10$

$A \cdot \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 19 \\ 10 \end{bmatrix}$

$A \cdot \begin{bmatrix} 1 \\ 2 \end{bmatrix} = \begin{bmatrix} m \\ n \end{bmatrix}$

$\Rightarrow$ **m + n = ?**

A) 15 B) 14 C) 13 D) 12 E) 11

11. $\begin{vmatrix} 555 & 999 \\ 444 & 777 \end{vmatrix} = ?$

A) -111^2 B) $(-111)^2$ C) -22^2

D) $(-222)^2$ E) -333^2

12. $\begin{vmatrix} x-y-z & x+y-z \\ x-y+z & x+y+z \end{vmatrix} = ?$

A) 4xy B) – 4xy C) 4yz

D) – 4yz E) $x^2 + y^2 + z^2$

13. $(a_n) = (n^2 + 5)$

$\Rightarrow \begin{vmatrix} a_1 & a_2 \\ a_3 & a_4 \end{vmatrix} = ?$

A) 46 B) 36 C) 26 D) 16 E) 0

14. $A = \begin{bmatrix} 18 & a \\ -5 & 0 \end{bmatrix}$

$\det(A) = 15$

$\Rightarrow$ **a = ?**

A) – 3 B) – 1 C) 0 D) 1 E) 3

15. $A = \begin{bmatrix} 1 & 3 \\ 2 & a+5 \end{bmatrix}$

$Ek(A) = A^{-1}$

$\Rightarrow$ **a = ?**

A) 0 B) 1 C) 2 D) 3 E) 4

16. $A = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 \\ 7 & 8 & 9 & 10 & 11 & 12 \end{bmatrix}_{2 \times 6}$

$A \cdot A^T = B$

$B = [b_{ij}]_{2 \times 2}$

$\Rightarrow \sum_{i=1}^{2} b_{ii} = ?$

A) 1300 B) 650 C) 325 D) 25 E) 0

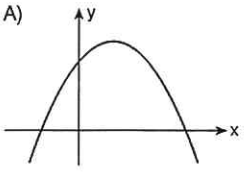
1-C 2-A 3-B 4-B 5-E 6-D 7-D 8-B 9-E 10-C 11-A 12-D 13-E 14-E 15-C 16-B

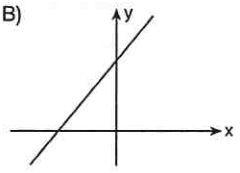
ÜNİTE 11

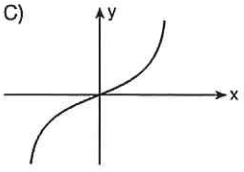
Unit 11

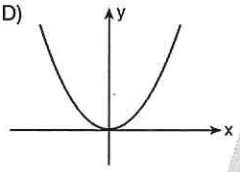
Özel Tanımlı Fonksiyonlar / Special Defined Functions

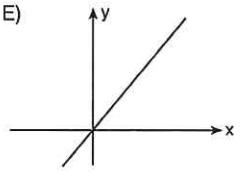
1. **Aşağıdakilerden hangisi çift fonksiyonun grafiğidir?**
Which of the following is the graph of even function?

A) 

B) 

C) 

D) 

E) 

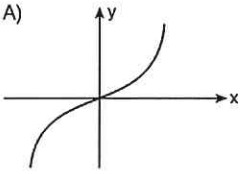
2. **Aşağıdakilerden hangisi çift fonksiyondur?**
Which of the following is a even function?

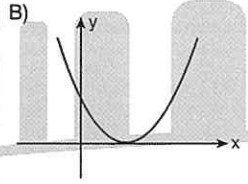
A) $f(x) = x^3 + x$ B) $f(x) = x^2 + x$

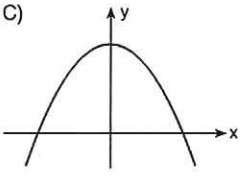
C) $f(x) = x^2 + 6$ D) $f(x) = x^3 + 7$

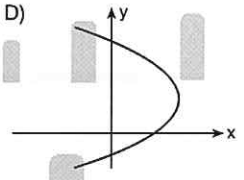
E) $f(x) = \tan x$

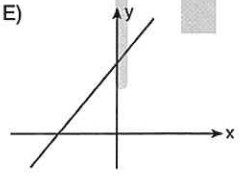
3. **Aşağıdakilerden hangisi tek fonksiyonun grafiğidir?**
Which of the following is the graph of odd function?

A) 

B) 

C) 

D) 

E) 

4. **Aşağıdakilerden hangisi tek fonksiyondur?**
Which of the following is a odd function?

A) $f(x) = x^2 + 6$ B) $f(x) = x^5 - 8x^3$

C) $f(x) = 7x^7 + 1$ D) $f(x) = x^4 + x$

E) $f(x) = \cos x$

5. **Aşağıdakilerden hangisi ne tek ne de çift fonksiyondur?**
Which of the following function neither odd function or even function?

A) $f(x) = 7x^8 + x^2$ B) $f(x) = \cot x$

C) $f(x) = x^3 + 5x$ D) $f(x) = 6x^2 - 7$

E) $f(x) = 5x + 4$

6. **Aşağıdakilerden hangisi hem çift hem de tek fonksiyondur?**
Which of the following is both odd and even function?

A) $f(x) = 2x - 3$ B) $f(x) = \sec x$

C) $f(x) = 0$ D) $f(x) = \log x$

E) $f(x) = e^{2x}$

7. **Aşağıdaki fonksiyonlardan hangisinin grafiği orijine göre simetriktir?**
Which of the following functions is the symmetrical according to the orijin?

A) $f(x) = x^4$ B) $f(x) = \sin^5 x$

C) $f(x) = |x|$ D) $f(x) = 3x^2 + 5x$

E) $\sin x + \cos x$

8. **Aşağıdaki fonksiyonlardan hangisinin grafiği y eksenine göre simetriktir?**
Which of the following functions is the symmetrical according to the y – axis?

A) $f(x) = \cot x$ B) $f(x) = 2x^2 + 3x$

C) $f(x) = 2x^3 + 3$ D) $f(x) = 5x^6 + 9$

E) $f(x) = |x - 3|$

9. $f(x) = (m-2)x^5 + (n+3)x^3 + x^2 + 8$

$f(x) = f(-x)$

$\Rightarrow$ **m . n = ?**

A) – 6 B) – 3 C) – 1 D) 1 E) 6

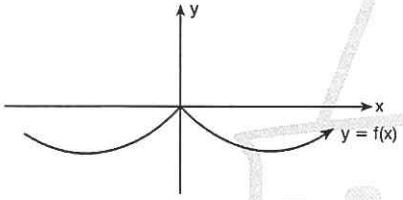
10. $f(x) = 3x^{11} + (a-5)x^4 + 2x^3 + b - 4$

$f(-x) = -f(x)$

$\Rightarrow$ **a . b = ?**

A) 1 B) 4 C) 5 D) 10 E) 20

11.



$2f(x) + 3f(-x) = 10x^2 + 35$

$\Rightarrow$ **$f(\sqrt{5})$ = ?**

A) 11 B) 13 C) 15 D) 17 E) 20

12. f: R → R

$f(x) = f(-x)$

$f(7) = 3k - 5$

$f(-7) = k + 11$

$\Rightarrow$ **k = ?**

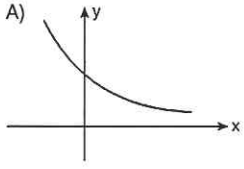
A) 3 B) 5 C) 6 D) 7 E) 8

13. f: R → R

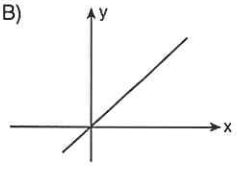
Aşağıdaki fonksiyonlardan hangisi (0, ∞) aralığında artan fonksiyondur?

Which of the following is the increasing function in the range of (0, ∞)?

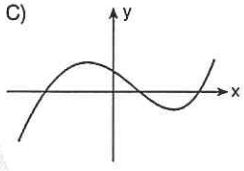
A)



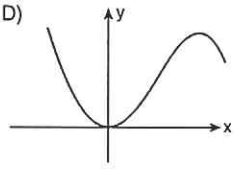
B)



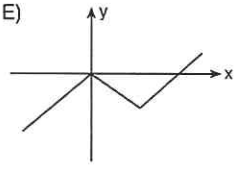
C)



D)



E)

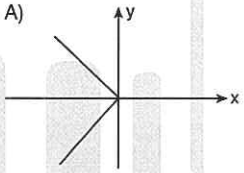


14. f: R → R

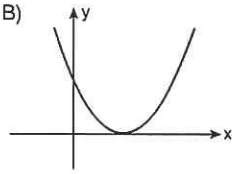
Aşağıdaki fonksiyonlardan hangisi azalan fonksiyondur?

Which of the following functions is decreasing?

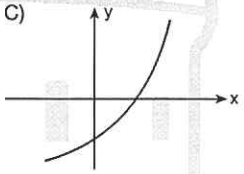
A)



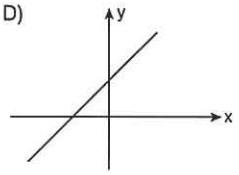
B)



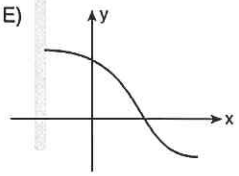
C)



D)



E)



1-D 2-C 3-A 4-B 5-E 6-C 7-B 8-D 9-A 10-E 11-D 12-E 13-B 14-E

TEST 2

1. $f(x) = \frac{x^2 + 4}{x^2 - 4}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $(2, \infty)$ B) $(-2, 2)$ C) $\{-2, 2\}$
D) $R \setminus \{-2, 2\}$ E) $R \setminus \{2\}$

2. $f(x) = \frac{x + 7}{x + 3}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $\{-3\}$ B) $R - \{3\}$ C) $R - \{-3\}$
D) $\{-3, 3\}$ E) R

3. $f(x) = \frac{3x - 4}{x^2 + x + 12}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) R B) $R \setminus \{3, 4\}$ C) $R \setminus \{-3, -4\}$
D) $\{3, 4\}$ E) $\{-3, -4\}$

4. $f: R \to R$

$$f(x) = \frac{7x^2 + 3x - 4}{x^2 - mx + m + 8}$$

m hangi aralıkta değer alır?
In which intervals "m" will have a value?

A) $(-4, 8)$ B) $(-8, 4)$ C) $\{-4, 8\}$
D) R E) $\varnothing$

5. $f(x) = \sqrt[3]{x^2 + 5x + 4}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $\varnothing$ B) R C) $(-1, -4)$
D) $(1, 4)$ E) $R \setminus \{-1, -4\}$

6. $f: A \to R$

$$f(x) = \sqrt{x - 1} + \sqrt{19 - x}$$

A kümesindeki tam sayıların toplamı kaçtır?
What is the sum of the integer numbers of A set?

A) 170 B) 180 C) 190 D) 200 E) 210

7. $f: A \to R$

$$f(x) = \frac{\sqrt{x - 3} + \sqrt{8 - x}}{\sqrt[3]{x - 5}}$$

A kümesindeki tam sayıların toplamı kaçtır?
What is the sum of the integer numbers of A set?

A) 33 B) 28 C) 27 D) 26 E) 25

8. $f(x) = \sqrt{\frac{\ln x}{x^2 - x - 2}}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) R B) $R - [-1, 2]$ C) $R - (2, e)$
D) $(-1, 1] \cup (2, \infty)$ E) $(0, 1] \cup (2, \infty)$

9. $f(x) = \sqrt{15 - |x|}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $(0, 15)$ B) $(-15, 0)$ C) $(-15, 15)$
D) $[-15, 15]$ E) $R \setminus \{-15, 15\}$

10. $f(x) = \sqrt{\frac{2x^2 + 11}{3 - |x-2|}}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $(-1, 5)$ B) $[-1, 5]$ C) R
D) $\varnothing$ E) $R - \{-1, 5\}$

11. $f(x) = \sqrt{-x^2 + 6x - 9}$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $R - \{3\}$ B) $\{-3\}$ C) $\{3\}$
D) $\{0, 3\}$ E) $\{-3, 0, 3\}$

12. $f(x) = \log_5(x - 4)$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $(-4, 4)$ B) $R - (-4, 4)$ C) R
D) $(4, \infty)$ E) $[4, \infty)$

13. $f(x) = \log_{(x-2)}(x^2 - 12x + 11)$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $(11, \infty)$ B) $(11, \infty) \setminus \{3\}$ C) R
D) $R \setminus \{3\}$ E) $(-11, 11)$

14. $f(x) = \log_{|x-3|}(-x^2 + 8x - 12)$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the widest domain of f function in the reel numbers?

A) $(2, 6)$ B) $[2, 6]$ C) $[2, 6] \cup \{4\}$
D) $(2, 6) - \{4\}$ E) $(2, 6) - \{3, 4\}$

1-D 2-C 3-A 4-A 5-B 6-C 7-B 8-E 9-D 10-A 11-C 12-D 13-A 14-E

TEST 3

1. $f(x) = \begin{cases} 3, & x > 0 \\ x^2, & x \le 0 \end{cases}$

$\Rightarrow$ **f(2020) + f(– 2) = ?**

A) 2024 B) 2018 C) 7 D) 3 E) 1

2. $f(x+1) = \begin{cases} 2, & x > 0 \\ x^2 - 1, & x \le 0 \end{cases}$

$\Rightarrow$ **f(2020!) + f(– 5) = ?**

A) 37 B) 35 C) 26 D) 25 E) 0

3. $f(x) = \begin{cases} x + 5, & x \ge 1 \\ |x - 3|, & x < 1 \end{cases}$

$g(x) = \begin{cases} 2x + 1, & x < 2 \\ x^2 + 5, & x \ge 2 \end{cases}$

$\Rightarrow$ **$(f + g)_{(4)}$ = ?**

A) 30 B) 18 C) 17 D) 16 E) 14

4. $f(x) = \begin{cases} 2x, & x > 3 \\ x^2, & x \le 3 \end{cases}$

$g(x) = \begin{cases} x + 7, & x \le 3 \\ 2x - 3, & x > 3 \end{cases}$

$\Rightarrow$ **$(fog)_{(3)}$ = ?**

A) 16 B) 17 C) 18 D) 19 E) 20

5. $f(x) = \begin{cases} 2x + a^2, & x > 5 \\ x + 3, & x \le 5 \end{cases}$

$(fof)_{(3)} = 16$

$\Rightarrow \prod a = ?$

A) 4 B) 2 C) 0 D) – 4 E) – 2

6. $f(x) = \begin{cases} 3x - 1, & x \ge 3 \\ x^2 + 1, & x < 3 \end{cases}$

$g(x) = \begin{cases} x^2 + 1, & x < 3 \\ 2x + 3, & x \ge 3 \end{cases}$

$\Rightarrow$ **$(2g - f)_{(x)}$ = ?**

A) $(2g - f)_{(x)} = \begin{cases} - x^2 + 6x - 2, & x \ge 3 \\ 2x^2 - 2x + 1, & x < 3 \end{cases}$

B) $(2g - f)_{(x)} = \begin{cases} 2x^2 - 3x - 3, & x \ge 3 \\ x + 7, & x < 3 \end{cases}$

C) $(2g - f)_{(x)} = \begin{cases} x + 7, & x \ge 3 \\ x^2 + 1, & x < 3 \end{cases}$

D) $(2g - f)_{(x)} = \begin{cases} x^2 + 1, & x \ge 3 \\ x + 7, & x < 3 \end{cases}$

E) $(2g - f)_{(x)} = \begin{cases} x^2 + 1, & x \ge 3 \\ x - 7, & x < 3 \end{cases}$

7. $f(x) = \begin{cases} x!, & x > 1 \\ x - 2, & x = 1 \\ x^2 + 3, & x < 1 \end{cases}$

$\Rightarrow$ **$(fofof)_{(1)}$ = ?**

A) 24 B) 12 C) 6 D) 4 E) 2

8. $f(x) = \begin{cases} x - 8, & x \geq 2 \\ -4 + x, & x < 2 \end{cases}$

$\Rightarrow f^{-1}(1) = ?$

A) 11 B) 9 C) 7 D) 6 E) 5

9. $f(x) = \begin{cases} x - 5, & x > 2 \\ 3x + 4, & x \leq 2 \end{cases}$

$g(x) = \begin{cases} |x - 4|, & x > 1 \\ (x - 1)!, & x \leq 1 \end{cases}$

$\Rightarrow (fog)_{(1)} + (gof)_{(-1)} = ?$

A) 10 B) 9 C) 8 D) 7 E) 6

10. $x \in Z$,

$\text{sgn}(|x - 4| - 2) = -1$

$\Rightarrow \sum x = ?$

A) 8 B) 9 C) 10 D) 12 E) 20

11. $x \in R$,

$\text{sgn}(49 - x^2) = 0$

$\Rightarrow \prod x = ?$

A) -49 B) -49^2 C) 0 D) 49 E) 49^2

12. $\text{sgn}(x^2 + 3) + \text{sgn}(\sqrt{3} - 2) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

13. $x \in Z$,

$\text{sgn}(x - 5) < -\text{sgn}(1 - x)$

$\Rightarrow \prod x = ?$

A) 0 B) 5 C) 10 D) 60 E) 120

14. $-3 < x < 0$

$\Rightarrow \text{sgn}(x + 3) + |x + 5| = ?$

A) $x + 3$ B) $x + 6$ C) $-x - 4$
D) $2x + 8$ E) 0

15. $a, b \in R$,

$a < 0 < b$

$\Rightarrow \text{sgn}\left(\frac{a}{b}\right) + \text{sgn}(a \cdot b) = ?$

A) 2 B) 1 C) 0 D) -1 E) -2

16. $\text{sgn}(x^2 + x + 1) = \text{sgn}\left(\frac{x - 7}{2 - x}\right)$

$\Rightarrow$ **S. S. = ?**

A) (0, 1) B) (1, 5) C) (2, 7)
D) [2, 7] E) Ø

1-C 2-A 3-A 4-E 5-D 6-C 7-A 8-B 9-C 10-D 11-A 12-A 13-E 14-B 15-E 16-C

TEST 4

1. $\frac{\pi}{2} < x < \pi$

$\Rightarrow \frac{\text{sgn(tanx) . sgn(cotx)}}{\text{sgn}(-x^2 + 3x - 7)} = ?$

A) – 1 B) 0 C) 1 D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{3}}{2}$

2. $A = \text{sgn}(x^2 - 2x + 2)$

$B = |1 - \sin x| + \text{sgn}(-2 + \cos x)$

$\Rightarrow$ **A + B = ?**

A) 1 B) 1 + sinx C) 1 – sinx D) 2 – sinx E) 2 + sinx

3. $\text{sgn}(x^2 + 7x - 18) = -1$

$\Rightarrow$ **S. S. = ?**

A) (– 2, 9) B) (2, ∞) C) (– 3, 6) D) (– 9, 2) E) $R - [-2, 9]$

4. $A = \text{sgn}(x^2 - 7x + 6) - \text{sgn}(x^2 - 9x + 8)$

$B = \text{sgn}(x^2 - 3x + 3)$

$A = 2B$

$\Rightarrow$ **S. S. = ?**

A) (1, 6) B) (1, 8) C) (– ∞, 6) D) (8, ∞) E) (6, 8)

5. $x \in Z$,

$\text{sgn}(x - 7) + \text{sgn}(3 - x) = -2$

$\Rightarrow \sum x = ?$

A) 8 B) 10 C) 13 D) 15 E) 25

6. $\sum_{k=-2}^{100} \text{sgn}(k^2 + 4k + 3) = ?$

A) 0 B) 1 C) 98 D) 99 E) 100

7. $f(x) = |x - 3| + \text{sgn}(x) + [\![x^2]\!]$

$\Rightarrow f(2 - \sqrt{10}) = ?$

A) $\sqrt{10} + 3$ B) $\sqrt{10} + 1$ C) $\sqrt{10}$ D) $\sqrt{10} - 1$ E) $\sqrt{10} - 3$

8. $\pi = 3{,}14\ldots$

$f(x) = |[\![x]\!]| + [\![|x|]\!] - \text{sgn}\sqrt[3]{x^2 - 9}$

$\Rightarrow f\left(-\frac{\pi}{2}\right) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

9. $\left[\!\left[\frac{2x-9}{5}\right]\!\right] = 6$

$\Rightarrow \sum x = ?$

A) 39 B) 41 C) 49 D) 50 E) 60

10. $\left[\!\left[x+\frac{3}{5}\right]\!\right] = x+\frac{3}{5}$

denklemini sağlayan kaç tane tam sayı vardır?
How many elements of set of the equation?

A) 0 B) 1 C) 2 D) 3 E) 4

11. $2[\![x]\!]^2 - 3[\![x]\!] - 2 = 0$

$\Rightarrow$ **S. S. = ?**

A) $\varnothing$ B) $\left[\frac{1}{2}, 2\right)$ C) $[2, 3)$

D) $(2, 3)$ E) $[2, 3]$

12. $[\![x+3]\!] + [\![x-2]\!] = 7$

$\Rightarrow$ **S. S. = ?**

A) $[2, 3)$ B) $[3, 4)$ C) $[4, 5)$

D) $[5, 6)$ E) $[6, 7)$

13. $[\![x + [\![x + [\![x-2]\!]]\!]]\!] = 10$

$\Rightarrow$ **S. S. = ?**

A) $[3, 4)$ B) $[4, 5)$ C) $[2, 3)$

D) $[5, 6)$ E) $[6, 7)$

14. $\left|\left[\!\left[\frac{x-3}{4} + \left[\!\left[\frac{x-3}{4}\right]\!\right]\right]\!\right]\right| < \text{sgn}(x^2 - 4x + 5)$

$\Rightarrow$ **S. S. = ?**

A) $[0, 7)$ B) $[1, 3)$ C) $[-3, 7)$

D) $[3, 4)$ E) $[3, 7)$

15. $[\![\log_2 8x]\!] + [\![\log_2 4x + 5]\!] = 16$

$\Rightarrow$ **S. S. = ?**

A) $[4, 8)$ B) $[8, 16)$ C) $[16, 32)$

D) $[32, 44)$ E) $[64, 68)$

16. $\left[\!\left[\sqrt{x-4}\right]\!\right] = 4$

denklemini sağlayan kaç tane tam sayı vardır?
How many elements of set of the equation?

A) 9 B) 10 C) 11 D) 12 E) 13

1-A 2-C 3-D 4-E 5-D 6-E 7-B 8-E 9-B 10-A 11-C 12-B 13-B 14-E 15-B 16-A

TEST 5

1. $x \in Z$,

$[\![2x - 12]\!] \leq -19$

$\Rightarrow$ **max(x) = ?**

A) -2 B) -3 C) -4 D) -5 E) -7

2. $f(x) = \dfrac{\sqrt{x - [\![x]\!]}}{\text{sgn}(x^2 - 7x + 6)} + \dfrac{\sqrt[3]{x^3 - 8}}{\left[\!\left[\dfrac{x-1}{5}\right]\!\right] + 11} + \log_{|x+9|}(x^2 - 16)$

fonksiyonu kaç x tam sayı değeri için tanımsızdır?
function is undefined for how many x integer values?

A) 12 B) 15 C) 18 D) 19 E) 20

3. $f(x) = \log\left(\left[\!\left[\dfrac{x-2}{3}\right]\!\right] - 1\right) - \ln(\text{sgn}(12 - x))$

f fonksiyonunun reel sayılarda en geniş tanım kümesi nedir?
What is the domain of f function in the real numbers?

A) $(5, 12)$ B) $[6, 12]$ C) $(7, 12)$
D) $[8, 12]$ E) $[8, 12)$

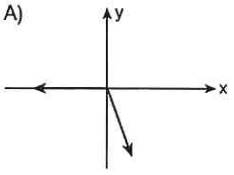
4. $[\![x - [\![2x]\!]]\!] = 2$

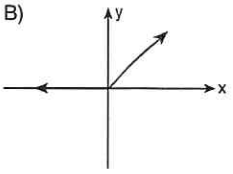
$\Rightarrow$ **S. S. = ?**

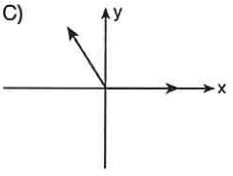
A) $[-1, 2)$ B) $[-1, 0)$ C) $[-2, 2)$
D) $\left[\dfrac{1}{2}, \dfrac{7}{2}\right)$ E) $\left[-\dfrac{5}{2}, -\dfrac{3}{2}\right)$

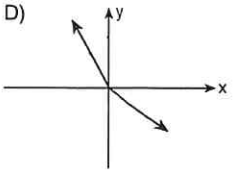
5. $f(x) = |x| - x$

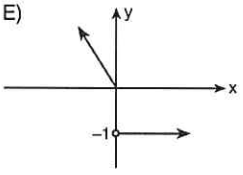
fonksiyonunun grafiği aşağıdakilerden hangisidir?
Which of the following is the graph of the f function?

A) 

B) 

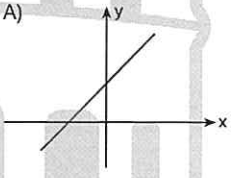
C) 

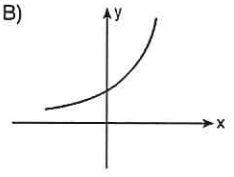
D) 

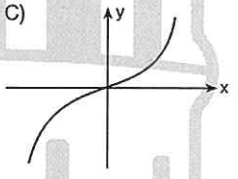
E) 

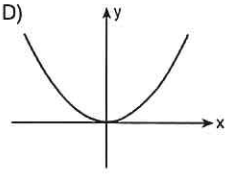
6. $f(x) = x \,.\, |x|$

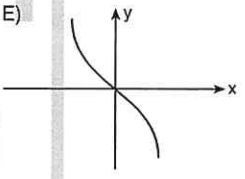
fonksiyonunun grafiği aşağıdakilerden hangisidir?
Which of the following is the graph of the f function?

A) 

B) 

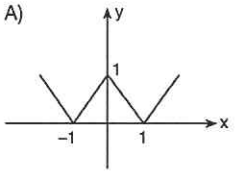
C) 

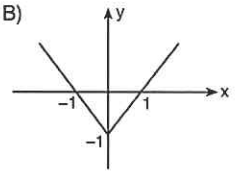
D) 

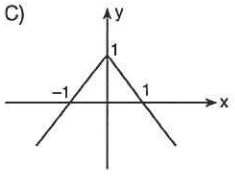
E) 

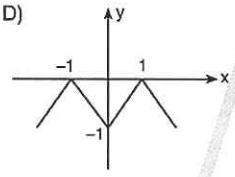
7. $f(x) = \big||x| - 1\big|$

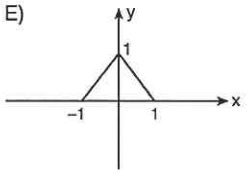
fonksiyonunun grafiği aşağıdakilerden hangisidir?
Which of the following is the graph of the f function?

A) 

B) 

C) 

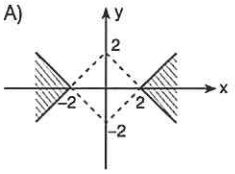
D) 

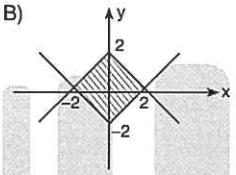
E) 

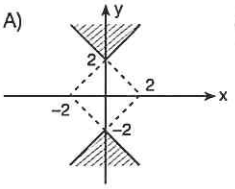
8. $y = f(x)$

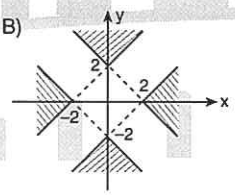
$|x| + |y| \leq 2$

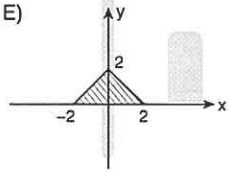
⇒ **graf(f(x)) = ?**

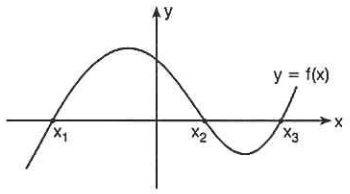
A) 

B) 

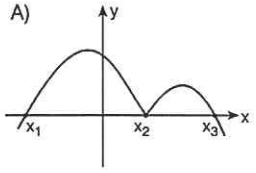
A) 

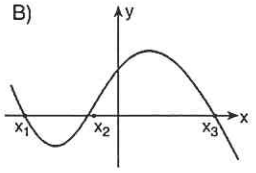
B) 

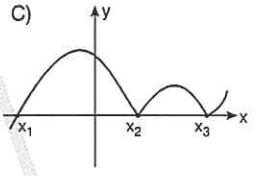
E) 

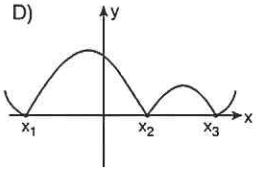
9. 

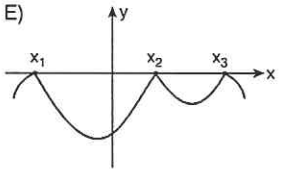
⇒ **graf|f(x)| = ?**

A) 

B) 

C) 

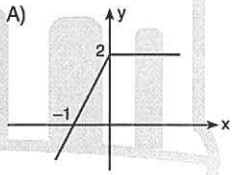
D) 

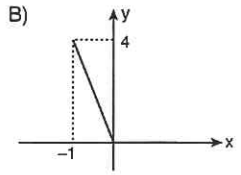
E) 

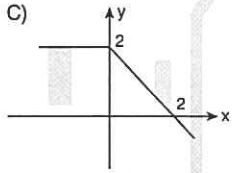
10. $f: R \to R$ $\quad f(x) = x + |x|$

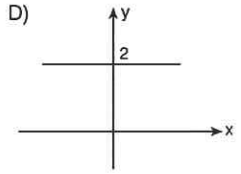
$g: R \to R$ $\quad g(x) = x + 2$

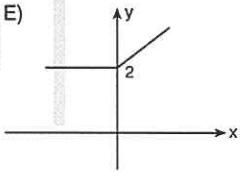
$(gof)_{(x)}$ fonksiyonunun grafiği aşağıdakilerden hangisidir?
Which of the following is the graph of the $(gof)_{(x)}$ function?

A) 

B) 

C) 

D) 

E) 

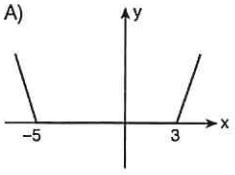
1-C 2-C 3-E 4-E 5-C 6-C 7-A 8-B 9-D 10-E

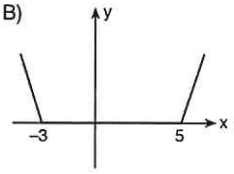
TEST 6

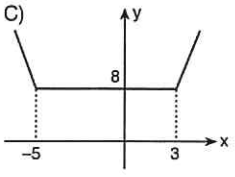
1. $y = |x - 3| + |x + 5|$

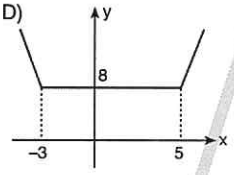
$f(x) = y$

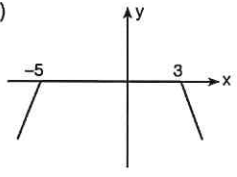
⇒ **graf(f(x)) = ?**

A)


B)


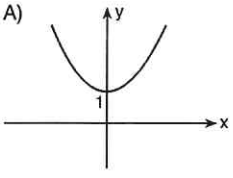
C)


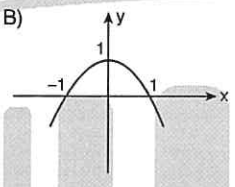
D)


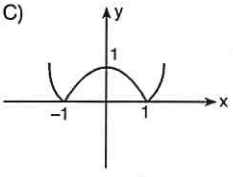
E)


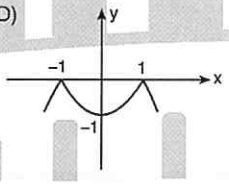
2. $f(x) = |1 - x^2|$

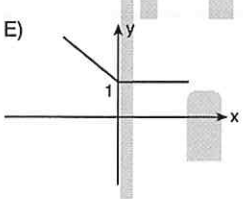
⇒ **graf(f(x)) = ?**

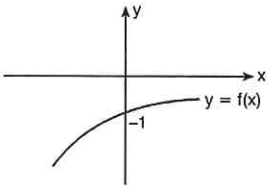
A)


B)


C)


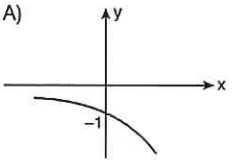
D)


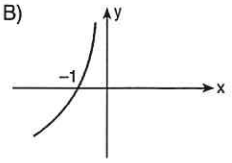
E)


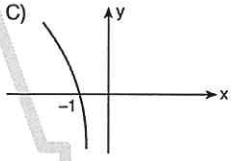
3.


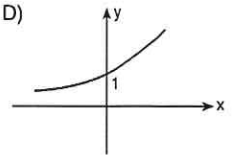
$f^{-1}(x)$ fonksiyonunun grafiği aşağıdakilerden hangisidir?

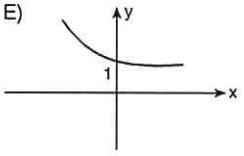
Which of the following is the graph of the $f^{-1}(x)$ function?

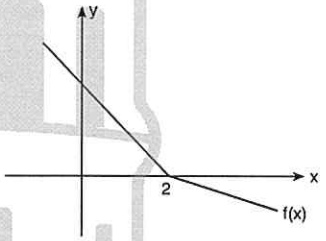
A)


B)


C)


D)


E)


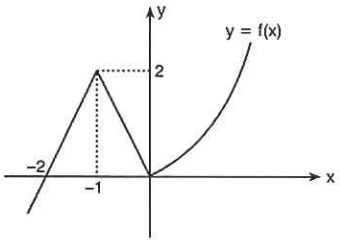
4.


$2f(x) - |f(x)| = -3x + 6$

⇒ **f(– 1) + f(3) = ?**

A) 4 B) 5 C) 6 D) 7 E) 8

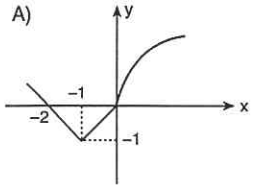
5.



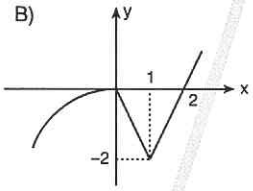
y = – f(– x) fonksiyonunun grafiği aşağıdakilerden hangisidir?

Which of the following is the graph of the y = – f(– x) function?

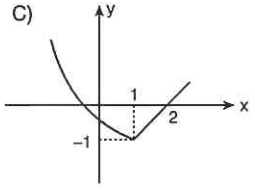
A)



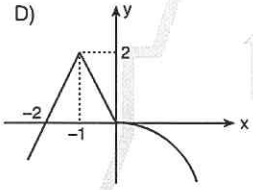
B)



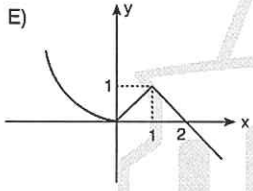
C)



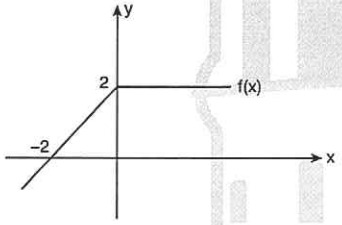
D)



E)



6.

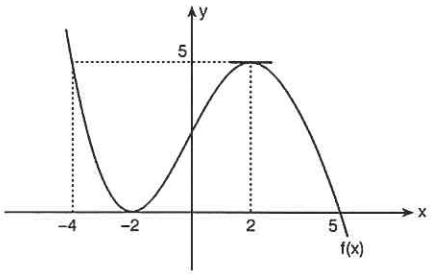


$f(x) - f(|x|) = -4$

⇒ **x = ?**

A) – 4 B) – 3 C) – 1 D) 5 E) 8

7.



$x \in Z$

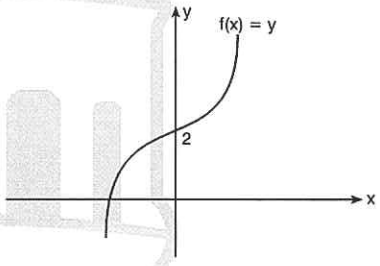
$0 < f(x) \leq 5$

S. S. = $\{x_1, x_2, x_3, \ldots x_n\}$

⇒ **n = ?**

A) 9 B) 8 C) 7 D) 6 E) 5

8.



⇒ **f(x) = ?**

A) $f(x) = |x| + 2$ B) $f(x) = |x| - 2$

C) $f(x) = x \,.\, |x| + 2$ D) $f(x) = |x^2 - 2|$

E) $f(x) = -|x^2 - 2|$

1-C 2-C 3-B 4-E 5-B 6-A 7-B 8-C

ÜNİTE 12

Unit 12

Limit / Limit

TEST 1

1. $\lim\limits_{x \to 2} \dfrac{x^3 - 8x + 8}{x^4 - 4x} = ?$

A) – 1 B) 0 C) 2 D) $\frac{3}{4}$ E) $\frac{7}{8}$

2. $\lim\limits_{x \to a} \dfrac{\sin x - \frac{\sqrt{3}}{2}}{\cos x - \frac{1}{2}} = -1$

$\Rightarrow$ **a = ?**

A) $\frac{\pi}{6}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) $\frac{\pi}{2}$ E) π

3. $\lim\limits_{x \to 0} \left(\dfrac{3x + \sin 5x}{7x - \tan 6x} \right) = ?$

A) 12 B) 11 C) 10 D) 8 E) 5

4. $C(n, r) = \dfrac{n!}{(n - r)! \, . \, r!}$

$\Rightarrow \lim\limits_{n \to \infty} \dfrac{C(n, 1) \, . \, C(n, 4)}{C(n, 3) \, . \, C(n, 2)} = ?$

A) 0 B) 1 C) 2 D) 3 E) $\frac{1}{2}$

5. $\lim\limits_{n \to \infty} \left(\dfrac{2x + 5}{2x + 3} \right)^{4x + 6} = ?$

A) 2 B) 4 C) e^2 D) e^4 E) ∞

6. $\lim\limits_{x \to -\infty} \left(8^{\frac{1}{x}} + 3^x + 2 \right) = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

7. $\lim\limits_{x \to +\infty} \dfrac{5^x - 5^{-x}}{5^x + 5^{-x}} = ?$

A) $-\infty$ B) ∞ C) – 1 D) 1 E) 0

8. $m, n \in R,$

$\lim\limits_{x \to 2} \dfrac{3 - \sqrt{m - x}}{x - 2} = n$

$\Rightarrow$ **m = ?**

A) 11 B) 10 C) 4 D) 3 E) 1

9. $\lim\limits_{x \to 1^+} \left(\dfrac{1 - x^2}{|1 - x|} \right) = ?$

A) 0 B) 2 C) – 2 D) 1 E) – 1

10. $\lim\limits_{x \to 3^+} \dfrac{[\![2x - [\![x + 3]\!]]\!]}{x - 3} = ?$

A) 3 B) 2 C) 1 D) 0 E) – 1

11. $\lim\limits_{x \to 3^+} \dfrac{[\![x^2]\!]}{x - 3} = ?$

A) ∞ B) 0 C) 1 D) – 1 E) $-\infty$

12. $\lim\limits_{x \to 3} \left(\dfrac{1}{x - 3} - \dfrac{6}{x^2 - 9} \right) = ?$

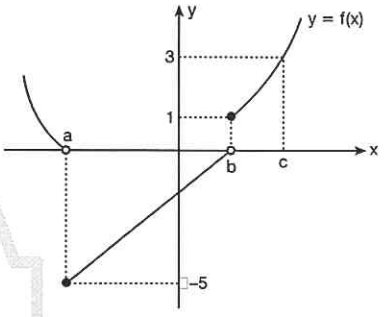
A) 6 B) 5 C) 3 D) $\dfrac{1}{5}$ E) $\dfrac{1}{6}$

13. $\lim\limits_{x \to 0^+} \dfrac{1 - \cos\sqrt{x}}{x} = a$

$\Rightarrow$ **a = ?**

A) 1 B) $\dfrac{1}{2}$ C) 0 D) $-\dfrac{1}{2}$ E) – 1

14.



$\lim\limits_{x \to a^+} f(x) + \lim\limits_{x \to b^-} f(x) + \lim\limits_{x \to c^+} f(x) = ?$

A) 0 B) – 1 C) – 2 D) – 3 E) – 4

15. $f(x) = \begin{cases} \dfrac{|x|}{x}, & x \neq 0 \\ 5, & x = 0 \end{cases}$

$\lim\limits_{x \to 0^+} f(x) = m$

$\lim\limits_{x \to 0^-} f(x) = n$

$\Rightarrow$ **m – n = ?**

A) 2 B) 1 C) 0 D) – 1 E) – 2

1-B 2-A 3-D 4-E 5-D 6-B 7-D 8-A 9-C 10-D 11-A 12-E 13-B 14-C 15-A

1. $\lim\limits_{x \to \pi}\left[\sin\left(\frac{x}{4}\right) + \cos\left(\frac{x}{3}\right) + g(x)\right) = \frac{\sqrt{2}-1}{2}$

$\Rightarrow \lim\limits_{x \to \pi} g(x) = ?$

A) π B) 1 C) -1 D) $-\frac{\pi}{2}$ E) $-\pi$

2. $\lim\limits_{x \to m}\left(\frac{\frac{x}{x+1} - \frac{m}{m+1}}{x-m}\right) = \frac{1}{9}$

$\Rightarrow m = ?$

A) 2 B) 3 C) 5 D) 8 E) 9

3. $f: R - \{2\} \to R$

$f(x) = \sqrt{2} \cdot \frac{x-2}{\sqrt{x} - \sqrt{2}}$

$\Rightarrow f\left(\lim\limits_{x \to 2} f(x)\right) = ?$

A) 0 B) 4 C) $2 + \sqrt{2}$ D) $2\sqrt{2} + 2$ E) $4\sqrt{2}$

4. $f(x) = \frac{x^2 - 2x + 3}{x^2 + 2ax + 2a - 1}$

fonksiyonu bir noktada süreksiz ise a için aşağıdakilerden hangisi doğrudur?
If the function is discontinuous at one point, which of the following is true for "a"?

A) $a \geq 1$ B) $a > 1$ C) $a \geq 2$ D) $a > 2$ E) $a = 1$

5. $\lim\limits_{x \to 1} \frac{27^x - 8 \cdot 3^x - 3^{2-x}}{1 - 3^{1-x}} = ?$

A) 30 B) 60 C) 90 D) 120 E) 180

6. $y = \sqrt{\frac{x^3}{x-1}}$

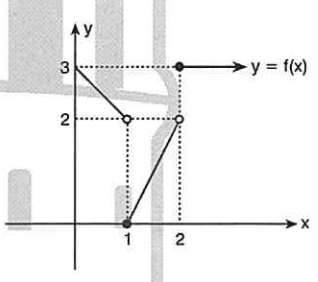
$\Rightarrow \lim\limits_{x \to -\infty} \frac{y}{x} = ?$

A) ∞ B) 1 C) $-\infty$ D) 0 E) -1

7. $\lim\limits_{h \to 0} \frac{(ax + h)^2 - (ax)^2}{h} = ?$

A) 2a B) 2ax C) 2x D) $\frac{1}{ax}$ E) $\frac{2}{ax}$

8.



$\Rightarrow \lim\limits_{x \to 1^-} (fof)_{(x)} = ?$

A) 0 B) 1 C) 2 D) 3 E) 6

9. $f(x) = \begin{cases} ax + b, & x > 1 \\ 3, & x = 1 \\ 3x^2 - a, & x < 1 \end{cases}$

$\lim\limits_{x \to 1} f(x) = f(1)$

$\Rightarrow$ **a . b = ?**

A) 0 B) 1 C) 2 D) 3 E) 6

10. $\lim\limits_{x \to 2} \dfrac{2x + 11}{x + 3} = ?$

A) 0 B) 1 C) 2 D) 3 E) ∞

11. $\lim\limits_{x \to 3} (2x - k) = 1$

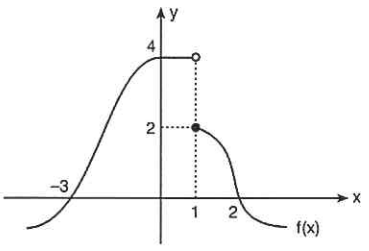
$\Rightarrow$ **k = ?**

A) 3 B) 5 C) 7 D) 9 E) 11

12. $\lim\limits_{x \to 5} \dfrac{5 - x}{x^2 + x + 1} = ?$

A) 7 B) 5 C) 3 D) 1 E) 0

13.



$\Rightarrow \dfrac{\lim\limits_{x \to 0} f(x) + \lim\limits_{x \to -3} f(x)}{\lim\limits_{x \to 1^+} f(x)} = ?$

A) 1 B) 2 C) 4 D) $\frac{1}{2}$ E) $\frac{1}{4}$

14. $\lim\limits_{x \to a} \dfrac{3x - 70}{x} = 10$

$\Rightarrow$ **a = ?**

A) 10 B) 0 C) – 10 D) – 20 E) – 30

15. $\lim\limits_{x \to 25} \left(3^{x - 22} + \log_5 x + \sqrt{x}\right) = ?$

A) 16 B) 26 C) 30 D) 34 E) 38

16. $\lim\limits_{x \to 2} f(x) = 3$

$\lim\limits_{x \to 1} g(x + 1) = 5$

$\Rightarrow \lim\limits_{x \to 5} \left[2f^2(x - 3) + g(x^2 - 23)\right] = ?$

A) 23 B) 22 C) 21 D) 11 E) 9

1-C 2-A 3-D 4-E 5-B 6-E 7-B 8-D 9-A 10-D 11-B 12-E 13-B 14-C 15-D 16-A

TEST 3

1. $\lim\limits_{x \to 2} \dfrac{x^2 + ax}{x - 2} \in R$

$\Rightarrow \lim\limits_{x \to a} \dfrac{x^2 + 3}{x - 1} = ?$

A) $\dfrac{7}{3}$ B) $-\dfrac{7}{3}$ C) 1 D) -1 E) 0

2. $\lim\limits_{x \to 2} \left(2g(x) - 3f(x)\right) = 7$

$\lim\limits_{x \to 2} \left(3g(x) + 3f(x)\right) = 3$

$\Rightarrow \lim\limits_{x \to 2} g(x) = ?$

A) 2 B) 3 C) 5 D) 10 E) 15

3. $m, n \in R,$

$\lim\limits_{x \to -1} \dfrac{x^2 + m}{\sqrt{2x + 3} - 1} = n$

$\Rightarrow m + n = ?$

A) -1 B) -2 C) -3 D) -4 E) -5

4. $\lim\limits_{x \to 0} \left(\dfrac{\sin x}{x} + \dfrac{x}{\tan 3x}\right) = ?$

A) 4 B) 3 C) $\dfrac{1}{3}$ D) $\dfrac{1}{4}$ E) $\dfrac{4}{3}$

5. $\lim\limits_{x \to 0} \dfrac{\sin^3 x}{x^3} + \lim\limits_{x \to 0} \dfrac{\tan^2 2x}{x^2} = ?$

A) 1 B) 2 C) 3 D) 5 E) 6

6. $\lim\limits_{x \to 0} \dfrac{\sin x}{x} = ?$

A) 0 B) 1 C) 10 D) 15 E) 20

7. $\lim\limits_{x \to \infty} \dfrac{\sin x}{x} = ?$

A) 0 B) 1 C) 10 D) 15 E) ∞

8. $\lim\limits_{x \to 0} \dfrac{\tan 21x}{\sin 3x} = ?$

A) 3 B) 5 C) 7 D) 21 E) ∞

9. $\lim\limits_{x \to y} \dfrac{\sin(x-y)}{x^2-y^2} = ?$

A) $-\dfrac{1}{2x}$ B) $\dfrac{1}{2x}$ C) $-\dfrac{1}{2y}$ D) $\dfrac{1}{2y}$ E) 0

10. $\lim\limits_{x \to 5} \dfrac{x^2-25}{\tan(\sqrt{x}-\sqrt{5})} = ?$

A) $\sqrt{5}$ B) $5\sqrt{5}$ C) $10\sqrt{5}$ D) $20\sqrt{5}$ E) $40\sqrt{5}$

11. $\lim\limits_{x \to 0} \dfrac{\tan 3x \,.\, \sin^2 5x}{4x^3} = ?$

A) 3 B) 5 C) 15 D) $\dfrac{15}{4}$ E) $\dfrac{75}{4}$

12. $\lim\limits_{x \to 0} \dfrac{8x \,.\, \sin 2x}{\tan^2 2x} = ?$

A) 1 B) 3 C) 4 D) 6 E) 8

13. $\lim\limits_{x \to 0} \left(\dfrac{8x^3 - 2\tan^3 x}{2x^3 + \tan^3 x}\right) = ?$

A) 1 B) 2 C) 3 D) 4 E) 8

14. $\lim\limits_{x \to 7} \dfrac{\sin(2x-14) + \sin(21-3x)}{x-7} = ?$

A) -1 B) 0 C) 1 D) 2 E) 3

15. $\lim\limits_{x \to 0} (5x \,.\, \cot x) = ?$

A) ∞ B) 0 C) 1 D) 3 E) 5

16. $\lim\limits_{x \to 0} \left(\dfrac{8\sin^2 x}{1-\cos x}\right) = ?$

A) 2 B) 4 C) 8 D) 16 E) 20

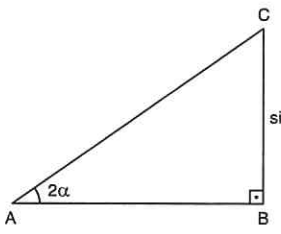
1-B 2-A 3-C 4-E 5-D 6-B 7-A 8-C 9-D 10-D 11-E 12-C 13-B 14-A 15-E 16-C

TEST 4

1. $\lim\limits_{x \to \frac{\pi}{2}} \dfrac{\sin 2x}{\sin x} = ?$

A) 0 B) $\frac{1}{2}$ C) 1 D) $\frac{3}{2}$ E) 2

2.



$[AB] \perp [BC]$

$m(\widehat{CAB}) = 2\alpha$

$|BC| = \sin\alpha$

$\Rightarrow \lim\limits_{\alpha \to 0} |AC| = ?$

A) – 2 B) 0 C) $\frac{1}{2}$ D) 1 E) 2

3. $\lim\limits_{x \to 0} \dfrac{(x+y)^3 - y^3}{x} = ?$

A) $-3x^2$ B) $-3x$ C) $2y^2$ D) $3y$ E) $3y^2$

4. $\lim\limits_{x \to \infty} \dfrac{3x^5 - x^2 + 1}{x^2 + x^m} \in R$

$\Rightarrow ? < m < ?$

A) $m \geq 2$ B) $m \geq 3$ C) $m \geq 4$ D) $m \geq 5$ E) $m = 3$

5. $\lim\limits_{x \to -\infty} \left(x - \sqrt{x^2 + 2x + 5}\right) = ?$

A) $-\infty$ B) – 1 C) 1 D) 5 E) ∞

6. $f(x) = \begin{cases} 2, & x = 1 \\ \dfrac{|x-1|}{x-1}, & x \neq 1 \end{cases}$

$\lim\limits_{x \to 1^-} f(x) = a$

$\lim\limits_{x \to 1^+} f(x) = b$

$\Rightarrow a - b = ?$

A) – 2 B) – 1 C) 0 D) 1 E) 2

7. $\lim\limits_{x \to -2} \dfrac{x + \sqrt{5 + \frac{x}{2}}}{4 + 2x} = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) $\frac{7}{8}$ D) $\frac{9}{8}$ E) $\frac{9}{16}$

8. $f(x) = x^5 + 3x^3 + 5x - 1$

$\lim\limits_{x \to \infty} \dfrac{f(2-x)}{f\left(\frac{x}{2} + 1\right)} = ?$

A) – 64 B) – 32 C) – 16 D) – 4 E) – 1

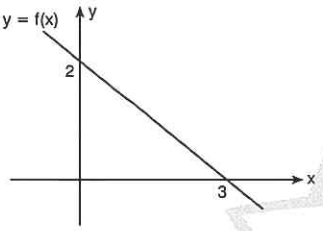
9. $\lim\limits_{x \to -\infty} \dfrac{\sqrt{x^2 - 2x - 3} - x}{|x - 1| + 2} = ?$

A) -2 B) -1 C) 1 D) 2 E) 3

10. $\lim\limits_{x \to \infty} \left[x \cdot (\sqrt{x^2 + 4} - x)\right] = ?$

A) 2 B) 1 C) $\dfrac{1}{2}$ D) $\dfrac{1}{4}$ E) ∞

11.



$\lim\limits_{x \to \infty} \dfrac{f^{-1}(x)}{f(x)} = ?$

A) $-\dfrac{9}{4}$ B) $\dfrac{9}{4}$ C) 3 D) 2 E) 0

12. $x \in R$,

$\lim\limits_{n \to \infty} \left(\dfrac{x - 14}{10}\right)^n = 0$

denklemini sağlayan kaç tane tam sayı vardır?
How many elements of set of the equation?

A) 12 B) 14 C) 17 D) 19 E) 21

13. $\lim\limits_{x \to -1} \left(\dfrac{ax^3 + bx^2 + cx + d}{(x + 1)^3}\right) = 2$

$\Rightarrow$ $a + b + c + d = ?$

A) 6 B) 10 C) 14 D) 16 E) 20

14. $\lim\limits_{x \to 5^-} \left(\dfrac{3}{4}\right)^{\frac{1}{x-5}} = ?$

A) $-\infty$ B) 0 C) $\dfrac{3}{4}$ D) 1 E) ∞

15. f: $R - \{2\} \to R$,

$f(x) = \dfrac{3x^2 - 12}{x - 2}$

$\Rightarrow$ $\lim\limits_{x \to 2} (fof)_{(x)} = ?$

A) 42 B) 36 C) 0 D) 6 E) -12

16. $f(x) = \begin{cases} x^2, & x < -1 \\ 3x - 5, & x \geq -1 \end{cases}$

$\lim\limits_{x \to a} f(x) \neq f(a)$

$\Rightarrow$ $\left| \lim\limits_{x \to a^+} f(x) - \lim\limits_{x \to a^-} f(x) \right| = ?$

A) 9 B) 8 C) 5 D) 4 E) 1

1-A 2-C 3-E 4-D 5-A 6-A 7-E 8-B 9-D 10-A 11-B 12-D 13-D 14-E 15-A 16-A

TEST 5

1. $\lim\limits_{x \to 0^+} (\log_{0,\overline{3}} x + \log_3 9x) = ?$

A) 3 B) 2 C) 1 D) 0 E) $-\infty$

2. $m \in N,\ n \in R,$

$$\lim_{x \to +\infty} \left(\frac{2 \cdot x^{4m-8} + 7x}{3 \cdot x^{m+1} - 5x^2} \right) = n$$

$\Rightarrow \sum m = ?$

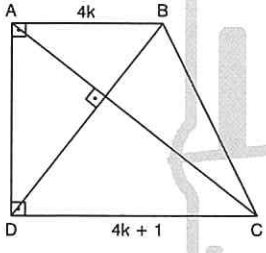
A) 9 B) 8 C) 7 D) 6 E) 5

3. $$\lim_{x \to +\infty} \left[\frac{3x^3 + 2x^2}{x^3 + 7x} + (m-1)x - n \right] = 5$$

$\Rightarrow$ **m . n = ?**

A) -3 B) -2 C) 0 D) 2 E) 3

4.



$|AB| = 4k \quad |DC| = 4k + 1 \quad [AC] \perp [BD]$

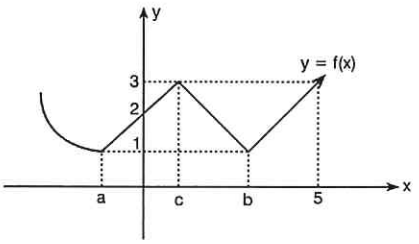
$$\lim_{k \to \infty} \frac{|DC| + |AD| + |AB|}{|BC|} = ?$$

A) 1 B) 2 C) 3 D) 4 E) 5

5. $$\lim_{x \to 0} \frac{(x+1).(x+2).(x+3).(x+4) - 24}{x} = ?$$

A) 20 B) 40 C) 50 D) 60 E) 70

6.



$$g(x) = \frac{1}{f(x) - 1}$$

$\lim\limits_{x \to k} g(x) \neq g(k)$

$\Rightarrow$ **k = ?**

A) {a, b} B) {a, b, 5} C) {a, b, c} D) {c} E) {a, 0, b}

7. $$\lim_{x \to \infty} \left[3x \cdot \sin\left(\frac{\pi}{x}\right) - 6 \cdot \sin\left(\frac{\pi}{x}\right) \right] = ?$$

A) 0 B) π C) 3 D) 3π E) $\frac{3\pi}{2}$

8. $$\lim_{x \to \infty} \frac{mx + 7}{3x - 4} = 2$$

$\Rightarrow$ **m = ?**

A) 3 B) 6 C) 9 D) 10 E) 11

9. $\lim\limits_{x \to \infty} \dfrac{7x - 3}{x^2 + 4} = ?$

A) ∞ B) 0 C) 7 D) 8 E) 9

10. $\lim\limits_{x \to \infty} \dfrac{x^2 + 3x - 4}{x - 5} = ?$

A) ∞ B) 0 C) 1 D) -1 E) -2

11. $\lim\limits_{x \to -\infty} \dfrac{(5x^2 - 1) \cdot (3 - x)}{x^2 + 4} = ?$

A) $-\infty$ B) 15 C) 10 D) 5 E) ∞

12. $\lim\limits_{x \to \infty} \dfrac{\sqrt{16x^2 + 5x + 1}}{4x + 1} = ?$

A) ∞ B) 4 C) 1 D) -1 E) $-\infty$

13. $\lim\limits_{x \to \infty} \dfrac{\sqrt{9x^2 + 3} + mx}{2x + 3} = 10$

$\Rightarrow$ $m = ?$

A) 3 B) 11 C) 13 D) 17 E) 20

14. $\lim\limits_{x \to \infty} \left(\log \sqrt{\dfrac{50x + 8}{5x - 1}}\right) = ?$

A) $\dfrac{1}{2}$ B) 1 C) 10 D) 100 E) ∞

15. $\lim\limits_{x \to \infty} \dfrac{(2x + 1)^3 \cdot (5 - x^2)^6}{(x^{11} + 4) \cdot (3x^2 - 1)^2} = ?$

A) $\dfrac{3}{5}$ B) $\dfrac{5}{2}$ C) $\dfrac{2}{5}$ D) $\dfrac{9}{8}$ E) $\dfrac{8}{9}$

16. $\lim\limits_{n \to \infty} \dfrac{5 + 7 + 9 + \ldots + (4n + 1)}{2n^2 + 5} = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

1-B 2-D 3-B 4-C 5-C 6-A 7-D 8-B 9-B 10-A 11-E 12-C 13-D 14-A 15-E 16-C

TEST 6

1. $\lim\limits_{x \to \infty} \dfrac{x^2 + \cos x}{2^x + \sin x} = ?$

A) ∞ B) 3 C) 2 D) 1 E) 0

2. $\lim\limits_{x \to \frac{7}{2}} \left([\![x]\!] - |\operatorname{sgn}(-x)| \right) = ?$

A) 1 B) 2 C) 3 D) 0 E) ∞

3. $\lim\limits_{x \to \frac{\pi}{2}^+} \operatorname{sgn}(\tan x) = A$

$\lim\limits_{x \to \frac{\pi}{2}^+} [\![\cos x]\!] = B$

$\Rightarrow$ **A + B = ?**

A) 0 B) – 1 C) – 2 D) – 3 E) – 4

4. $\lim\limits_{x \to \infty} \dfrac{5^x - 3^{x-1}}{5^{x+2} + 3^x} = ?$

A) 0,2 B) 0,4 C) 0,04 D) 0,5 E) 0,005

5. $\lim\limits_{n \to \infty} \dfrac{3n^n + \log n + 7}{n! - 3n^2 + 5} = ?$

A) ∞ B) 3 C) 1 D) 0 E) $-\infty$

6. $\lim\limits_{n \to -\infty} \left(\dfrac{\sqrt{9x^2 + x - 3} - 5x}{\sqrt[3]{x^3 + 4x^2 + 1} + 2x} \right) = ?$

A) $\dfrac{3}{5}$ B) $\dfrac{8}{3}$ C) 0 D) $-\dfrac{8}{3}$ E) $-\dfrac{3}{5}$

7. $\lim\limits_{x \to \infty} \left(\dfrac{3}{x^2 - 9} + \dfrac{mx + 1}{x + 3} \right) = 6$

$\Rightarrow$ **m = ?**

A) 2 B) 4 C) 6 D) 8 E) 10

8. $\lim\limits_{x \to 1} \dfrac{x^3 - 1}{x - 1} = ?$

A) 1 B) 3 C) 5 D) 7 E) ∞

9. $\lim\limits_{x \to 5} \dfrac{\sqrt{x} - \sqrt{5}}{x - 5} = ?$

A) $\dfrac{\sqrt{5}}{10}$ B) $\sqrt{\dfrac{5}{10}}$ C) $\sqrt{5}$ D) $\dfrac{\sqrt{5}}{3}$ E) $\dfrac{\sqrt{5}}{5}$

10. $\lim\limits_{x \to \infty} \left(x \,.\, \ln\left(1 + \dfrac{3}{x}\right)\right) = ?$

A) e^3 B) e^2 C) e D) 2 E) 3

11. $\lim\limits_{x \to \infty} \left(\sqrt{x^2 - 4x} - x\right) = ?$

A) – 6 B) – 2 C) 0 D) 6 E) ∞

12. a, b ∈ R,

$$f(x) = \begin{cases} x^2, & x > 5 \\ 4, & x = 5 \\ x + a, & x < 5 \end{cases}$$

$\lim\limits_{x \to 5} f(x) = b$

$\Rightarrow$ a = ?

A) 10 B) 13 C) 15 D) 20 E) 258

13. $\lim\limits_{x \to 1} \dfrac{x^5 - 1}{x - 1} = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

14. $\lim\limits_{a \to b} \dfrac{a^3 - b^3}{a^2 - b^2} = ?$

A) $\dfrac{3}{2}$a B) $\dfrac{3}{2}$b C) $\dfrac{2}{3}$a D) $\dfrac{2}{3}$b E) 0

15. $\lim\limits_{x \to 64} \dfrac{\sqrt[3]{x} - 4}{\sqrt{x} - 8} = ?$

A) 5 B) 4 C) $\dfrac{1}{5}$ D) $\dfrac{1}{4}$ E) $\dfrac{1}{3}$

16. $\lim\limits_{x \to 1} \dfrac{\sin \pi x}{\cos\left(\dfrac{\pi}{2} x\right)} = ?$

A) – 2 B) – 4 C) ∞ D) 4 E) 2

1-E 2-B 3-C 4-C 5-A 6-D 7-C 8-B 9-A 10-E 11-B 12-D 13-A 14-B 15-E 16-E

TEST 7

1. $\lim\limits_{\alpha \to 1} \dfrac{\sin\pi\alpha}{1-\alpha^2} = ?$

A) $\dfrac{\pi}{2}$ B) $\dfrac{\pi}{3}$ C) $\dfrac{\pi}{4}$ D) $\dfrac{3\pi}{2}$ E) 2π

2. $\lim\limits_{x \to 0} \dfrac{1-\cos 2x}{x^2 + 5x \cdot \sin 2x} = ?$

A) $\dfrac{1}{2}$ B) 1 C) 0 D) $\dfrac{3}{5}$ E) $\dfrac{2}{11}$

3. $\lim\limits_{x \to 0} \dfrac{1 + 2\sin x - \cos x}{1 - \sin 2x - \cos 2x} = ?$

A) -1 B) $\dfrac{1}{2}$ C) $-\dfrac{1}{2}$ D) 0 E) 1

4. $\lim\limits_{\alpha \to \frac{\pi}{4}} \dfrac{\sin^2\alpha - \sin\frac{\pi}{6}}{\sin 4\alpha} = ?$

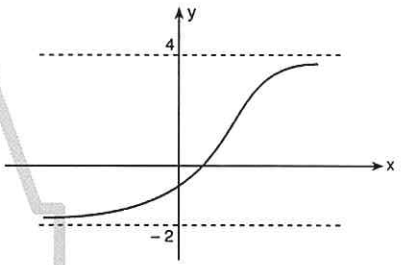
A) $\dfrac{1}{4}$ B) $-\dfrac{1}{4}$ C) $\dfrac{1}{8}$ D) $-\dfrac{1}{8}$ E) 0

5. $$f(x) = \begin{cases} \text{sgn}(x-1), & x > 2 \\ \text{sgn}(x-4) + 3, & x \le 2 \end{cases}$$

$\Rightarrow \lim\limits_{x \to 3} f(x) + \lim\limits_{x \to 1} f(x) = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

6.



$\Rightarrow \lim\limits_{x \to \infty} [f(x) - 3] + \lim\limits_{x \to -\infty} [f(x) + 4] = ?$

A) 0 B) 2 C) 3 D) 4 E) 7

7. $a \in R$,

$$f(x) = \begin{cases} \dfrac{2}{x-8}, & x > 3 \\ \dfrac{5x}{x^2 - 7}, & x \le 3 \end{cases}$$

$\lim\limits_{x \to a} f(x) \neq f(a)$

$\Rightarrow a = ?$

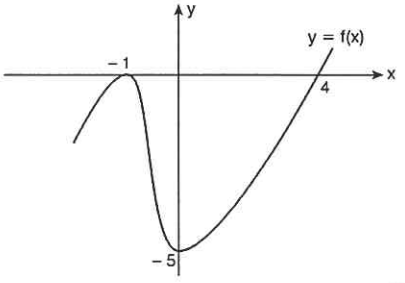
A) $\{-\sqrt{7}, \sqrt{7}, 3, 8\}$ B) $\{-\sqrt{7}, 3, 8\}$ C) $\{3, 8\}$

D) $\{8\}$ E) $\{-\sqrt{7}, \sqrt{7}\}$

8. $\lim\limits_{x \to 1} \dfrac{\sqrt{x+3} - \sqrt{3x+1}}{\sqrt{x-1}} = ?$

A) 0 B) 1 C) 2 D) 3 E) ∞

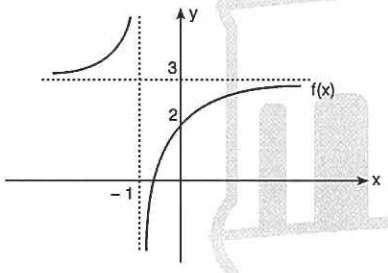
9.



$\Rightarrow \lim\limits_{x \to 0} [\![f(x) \cdot \text{sgn}(f(x))]\!] = ?$

A) 5 B) 4 C) 3 D) – 4 E) – 5

10.



$f: R \setminus \{-1\} \to R \setminus \{3\}$

$\Rightarrow \lim\limits_{x \to -\infty} f(x) + \lim\limits_{x \to 0} f(x) = ?$

A) 1 B) 2 C) 3 D) 4 E) 5

11. $a, b \in R$

$6b - a = 0$

$\lim\limits_{x \to +\infty} \dfrac{(2b-10)x^5 + (a-3)x^4 + 2x - 5}{ax^5 - bx^4 + 6x + 1} = 2$

$\Rightarrow a \cdot b = ?$

A) 6 B) – 6 C) 5 D) – 5 E) 2

12. $\lim\limits_{x \to 0} \dfrac{5.(x + \arcsin x)}{\sin 2x} = ?$

A) – 2 B) – 1 C) 1 D) 5 E) 10

13. $f^{-1}(x) = \dfrac{x+1}{2}$

$g(x) = \dfrac{x^2 - 2}{2x}$

$\Rightarrow \lim\limits_{x \to 2} \dfrac{(fog)(x)}{x-2} = ?$

A) 0 B) 1 C) $\frac{1}{2}$ D) $\frac{3}{2}$ E) 5

14. $\lim\limits_{x \to 0} \dfrac{3 \cdot \sin 3x}{2 - \sqrt{4-x}} = ?$

A) 12 B) 20 C) 24 D) 30 E) 36

1-A 2-E 3-A 4-B 5-D 6-C 7-A 8-A 9-B 10-E 11-A 12-D 13-D 14-E

TEST 8

1. $\lim\limits_{x \to 5} \dfrac{\sqrt{4x+5}-5}{x^2-25} = ?$

A) 0,2 B) 0,02 C) 0,4 D) 0,04 E) 0,5

2. $\lim\limits_{x \to \infty} \left(1 + \dfrac{5}{3x+1}\right)^{12x+1} = ?$

A) e^{60} B) e^{20} C) e^{15} D) 15 E) 20

3. $\lim\limits_{x \to 3^+} f(x) = 5$

$\lim\limits_{x \to 3^-} f(x) = 1$

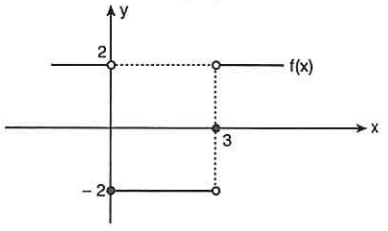
$\Rightarrow \lim\limits_{x \to 2^+} \dfrac{f(x^2-1)+f(x+1)}{f(5-x)} = ?$

A) 10 B) 8 C) 6 D) 5 E) 2

4. $\lim\limits_{x \to \infty} \dfrac{e^{-3x}+e^{4x}}{\ln x + 3e^{4x}} = ?$

A) 4 B) 2 C) 1 D) $\frac{1}{2}$ E) $\frac{1}{3}$

5. f: R → R



$g(x_0) = f(x_0) + \lim\limits_{x \to x_0^+} f(x)$

$\Rightarrow$ **(gof)(3) = ?**

A) – 5 B) – 4 C) – 3 D) – 2 E) 0

6. $\lim\limits_{x \to 0} \dfrac{\sqrt{x+3}-\sqrt{3}}{x} = ?$

A) $\sqrt{3}$ B) $\frac{\sqrt{3}}{2}$ C) $\frac{\sqrt{3}}{6}$ D) $\frac{2\sqrt{3}}{3}$ E) 1

7. L ∈ R,

f: R → R g: R → R

$\lim\limits_{x \to 3} f(x) = \lim\limits_{x \to 3} g(x) = L$

I. $f(3) = g(3)$

II. $\lim\limits_{x \to 3} [f(x) - g(x)] = 0$

III. $\lim\limits_{x \to 3} \dfrac{f(x)}{g(x)} = 1$

ifadelerinden hangileri her zaman doğrudur?

Which of the following is/are always true?

A) Yalnız I B) Yalnız II C) I ve II

D) II ve III E) I, II ve III

8. $\lim\limits_{x \to \pi} \dfrac{x^2 \cdot \sin(\pi - x) + \pi^2 \cdot \sin(x - \pi)}{2.(\pi - x)^2} = ?$

A) 2π B) π C) 0 D) $-\pi$ E) -2π

9. $\lim\limits_{x \to \frac{\pi}{2}} (\tan x - \sec x) = ?$

A) 0 B) 1 C) -1 D) e E) ∞

10. $\lim\limits_{x \to 2} \dfrac{f(x+1) + 3x}{x} = 3$

$\Rightarrow \lim\limits_{x \to 3} \dfrac{f(2x-3) + 5x}{2x} = ?$

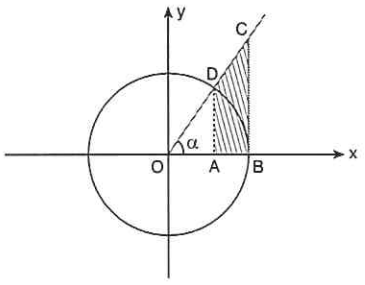
A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) $\frac{5}{2}$ D) $\frac{7}{2}$ E) $\frac{9}{2}$

11. $A = \begin{bmatrix} \sin x & \cos x \\ \sin y & \cos y \end{bmatrix}_{2 \times 2}$

$\Rightarrow \lim\limits_{x \to y} \dfrac{\det A}{x - y} = ?$

A) 0 B) 1 C) 2 D) 3 E) ∞

12.



$[AD] // [BC]$, $[BC] \perp [OB]$, $m(\widehat{DOA}) = \alpha$

$\Rightarrow \lim\limits_{\alpha \to 0} \dfrac{A(ABCD)}{2\sin^3\alpha} = ?$

A) 1 B) $\frac{1}{2}$ C) $\frac{1}{3}$ D) $\frac{2}{3}$ E) $\frac{1}{4}$

13. $f: R \to R$

$$f(x) = \begin{cases} a.\sin x \cdot \cos x, & x > \dfrac{\pi}{12} \\ \log_{\cot x} \tan x, & x = \dfrac{\pi}{12} \\ b \cdot (\cos^2 x - \sin^2 x) & x < \dfrac{\pi}{12} \end{cases}$$

$\lim\limits_{x \to \frac{\pi}{12}} f(x) = f\left(\dfrac{\pi}{12}\right)$

$\Rightarrow a \cdot b = ?$

A) $-\frac{\sqrt{3}}{3}$ B) $\frac{\sqrt{3}}{3}$ C) $-\frac{8\sqrt{3}}{3}$ D) $\frac{8\sqrt{3}}{3}$ E) 1

14. $\lim\limits_{x \to 3} \dfrac{\sqrt{3} \cdot x - 3\sqrt{x}}{x - 3} = ?$

A) $\frac{\sqrt{3}}{2}$ B) $\frac{\sqrt{2}}{2}$ C) $\frac{1}{2}$ D) 0 E) $\sqrt{3}$

1-D 2-B 3-A 4-E 5-B 6-C 7-B 8-D 9-A 10-C 11-B 12-E 13-D 14-A

ÜNİTE 13

Unit 13

Türev / Derivative

1. $f(x) = \frac{x^6}{6} - \frac{x^4}{4} + x^{-3}$

$\Rightarrow$ **f'(x) = ?**

A) $x^5 - x^3 - 3x^{-4}$ B) $x^5 - x^3 - x^{-2}$

C) $x^5 + x^3 - x^{-2}$ D) $x^5 + x^3 + x^{-2}$

E) $x^5 + x^3 + x^{-4}$

2. $f(x) = (3x^2 - 2x)^4$

$\Rightarrow$ **f'(1) = ?**

A) 20 B) 18 C) 16 D) 14 E) 12

3. $f(x) = (x^2 - 2x)^2$

$f'(m) = 24$

$\Rightarrow$ **m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $f(x) = 1 + x + x^2 + x^3 + \ldots + x^{19}$

$\Rightarrow \left.\frac{df(x)}{dx}\right|_{x=1} = ?$

A) 0 B) 10 C) 90 D) 190 E) 19!

5. $y = 2a^2 + 3a + x$

$\Rightarrow \frac{dy}{da} = ?$

A) 1 B) 0 C) 4a + 3

D) 4a + 3 + x E) $2a^2 + 3a + 1$

6. $f(x) = \frac{1}{x^2} + \frac{1}{x^4}$

$\Rightarrow \lim_{x \to 1} \frac{f(x) - f(1)}{x - 1} = ?$

A) 4 B) 0 C) – 4 D) – 5 E) – 6

7. $f(x) = \sqrt{x + 8}$

$\Rightarrow$ **f'(28) = ?**

A) $\frac{1}{12}$ B) $\frac{1}{24}$ C) $\frac{1}{36}$ D) $\frac{1}{48}$ E) $\frac{1}{96}$

8. $f(x) = x^{\pi}$

$\Rightarrow \lim_{h \to 0} \frac{f(h + \pi) - f(\pi)}{h} = ?$

A) π^2 B) 2^{π} C) $\pi^{\pi - 1}$ D) π^{π} E) 0

9. $\frac{d}{dx}(\sin x + \cos x) = ?$

A) $\cos x + \sin x$ B) $\cos x - \sin x$ C) 1

D) 0 E) $\tan x$

10. $y = \sin^2 x$

$\Rightarrow \frac{dy}{dx} = ?$

A) $2.\sin x$ B) $2.\cos x$ C) $\sin 2x$

D) $\cos 2x$ E) $\sec 2x$

11. $f(x) = \cos(x^2)$

$\Rightarrow f'(x) = ?$

A) $2x \cdot \sin(x^2)$ B) $\sin(x^2)$ C) $-\sin(x^2)$

D) $-2x \cdot \sin(x^2)$ E) $-2x \cdot \sin 2x$

12. $f(x) = \cos^2(x^2)$

$\Rightarrow f'(0) = ?$

A) 0 B) 1 C) $\frac{1}{2}$ D) $\frac{\sqrt{2}}{2}$ E) $\frac{\sqrt{3}}{2}$

13. $f(x) = e^{5x}$

$\Rightarrow f'(x) = ?$

A) e^{5x} B) $5e^{4x}$ C) $5e^{5x}$ D) 1 E) 0

14. $f(x) = 5^{3x}$

$\Rightarrow f'(x) = ?$

A) $3 \cdot 5^{3x}$ B) $3 \cdot 5^{3x} \cdot \ln 5$ C) 0

D) $3 \cdot \ln 5$ E) $5 \cdot \ln 3$

15. $f(x) = x^e + e^x$

$\Rightarrow f'(x) = ?$

A) 0 B) e^x C) x^e

D) $x^e \cdot e^x$ E) $e \cdot x^{e-1} + e^x$

16. $f(x) = \ln(\sin x)$

$\Rightarrow \frac{df(x)}{dx} = ?$

A) $\sec x$ B) $\operatorname{cosec} x$ C) 1

D) $\cot x$ E) $\tan x$

1-A 2-C 3-C 4-D 5-C 6-E 7-A 8-D 9-B 10-C 11-D 12-A 13-C 14-B 15-E 16-D

TEST 2

1. $f(x) = \ln(8x)$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(x+h) - f(x)}{h} = ?$

A) 8 B) 8x C) $\frac{1}{x}$ D) $\frac{1}{8}$ E) $\frac{1}{8x}$

2. $f(x) = \cos^2(5x)$

$\Rightarrow \lim\limits_{x \to \frac{\pi}{20}} \dfrac{f(x) - f\left(\frac{\pi}{20}\right)}{x - \frac{\pi}{20}} = ?$

A) – 5 B) – 1 C) 0 D) 1 E) 5

3. $f(x) = \arctan(x^3 - 25)$

$\Rightarrow f'(3) = ?$

A) 2 B) 2,4 C) 2,7 D) 5 E) 5,4

4. $f(x) = \dfrac{7}{(x^2+2)^3}$

$\Rightarrow f'(1) = ?$

A) $-\frac{1}{2}$ B) $\frac{1}{2}$ C) $-\frac{42}{81}$ D) $\frac{42}{81}$ E) – 2

5. $f(x) = \sqrt[3]{x^2 + 4}$

$\Rightarrow f'(2) = ?$

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

6. $f(x) = 2x + 1$

$g(x) = x^2 + 1$

$\Rightarrow (gof)'(x) = ?$

A) 8x + 4 B) 4x + 1 C) 2x + 1 D) 2x E) 0

7. $f(x) = (x^{20} - 1) \cdot (x^{20} + 1)$

$\Rightarrow [f(40)]' = ?$

A) 40^{40} B) 40! C) 0 D) – 40! E) -40^{40}

8. $g(-2) = 4$

$g'(-2) = 3$ $\Rightarrow (fog)'(-2) = ?$

$f'(4) = 5$

A) 3 B) 4 C) 5 D) 15 E) 25

9. $f(x-7) = g^2(x^2-3)$

$\Rightarrow$ **$f'(-5) = ?$**

A) $g(1)$ B) $2g(1)$ C) $4g(1)$

D) $8g(1)$ E) 0

10. $f(x) = (\sin x + \cos x)^2$

$\Rightarrow$ **$f'(x) = ?$**

A) $2\sin 2x$ B) $2\cos 2x$ C) 0

D) $\sin^2 x$ E) $\cos^2 x$

11. $f(x) = \cos^2 x - \sin^2 x$

$\Rightarrow$ **$f'\left(\frac{3\pi}{4}\right) = ?$**

A) -2 B) -1 C) 0 D) 1 E) 2

12. $\frac{d}{dx}\left(\frac{2\tan x}{1-\tan^2 x}\right) = ?$

A) $2\tan x(1+\tan^2 x)$ B) $2\tan x$ C) $1+\tan^2 x$

D) $2.(1+\tan^2 2x)$ E) $\tan^2 x$

13. $f(x) = \ln x$

$g(x) = e^{3x^2+4}$

$\Rightarrow$ **$(fog)'(x) = ?$**

A) $3x^2+4$ B) $6x$ C) 1 D) $\frac{1}{x}$ E) $\frac{1}{3x^2+4}$

14. $f(x) = (x^2+1)\,.\,(x-1)^{-3}$

$\Rightarrow$ **$f'(0) = ?$**

A) -3 B) -1 C) 0 D) 1 E) 3

15. $f(x) = 3x\,.\,\cos x$

$\Rightarrow$ **$f'(\pi) = ?$**

A) 3 B) 1 C) 0 D) -1 E) -3

16. $f(x) = 2\tan x + \cot 2x$

$\Rightarrow$ **$f'\left(\frac{\pi}{3}\right) = ?$**

A) $\frac{1}{3}$ B) $\frac{4}{3}$ C) $\frac{8}{3}$ D) $\frac{16}{3}$ E) $\frac{32}{3}$

1-C 2-A 3-E 4-C 5-D 6-A 7-C 8-D 9-D 10-B 11-E 12-D 13-B 14-A 15-E 16-D

TEST 3

1. $f(x) = \sin^2(\cos x) + \cos^2(\cos x)$

$\Rightarrow$ **$f'(x) = ?$**

A) 0 B) $\sin^3(\cos x)$ C) $\cos^3 x$ D) $\tan^3(\cos x)$ E) $\cot^3(\sin x)$

2. $f(x) = (\tan x \cdot \cos x)^3$

$\Rightarrow$ **$f'\left(\frac{\pi}{4}\right) = ?$**

A) $\frac{3}{4}$ B) $\frac{\sqrt{2}}{4}$ C) $\frac{3\sqrt{2}}{4}$ D) 1 E) 0

3. $f(x) = \frac{\cos x + \sin x}{\sin x}$

$\Rightarrow \lim\limits_{x \to \frac{\pi}{4}} \frac{f(x) - f\left(\frac{\pi}{4}\right)}{x - \frac{\pi}{4}} = ?$

A) -2 B) 0 C) 1 D) 2 E) 3

4. $\sqrt{x} \cdot \frac{d(x\sqrt{x})}{dx} = ?$

A) $\frac{3}{2}$ B) $\frac{3}{2} \cdot x$ C) $\frac{1}{2} \cdot x$ D) $\sqrt{x}$ E) $\frac{\sqrt{2}}{x}$

5. $f(x) = (x^2 - 1) \cdot (x^2 + 1) \cdot (x^4 + 1)$

$\Rightarrow$ **$f'(8) = ?$**

A) 0 B) 2^8 C) 2^{16} D) 2^{24} E) 2^{32}

6. $f(x) = (x - 2) \cdot (x - 3) \cdot (x - 4) \cdot (x - 5)$

$\Rightarrow$ **$f'(5) = ?$**

A) 6^6 B) 6! C) 6 D) 1 E) 0

7. $f(x) = \sqrt{x} + e^{6x}$

$\Rightarrow$ **$f'(1) = ?$**

A) $\frac{1}{2} + 6e^6$ B) $\frac{1}{2}$ C) $6e^6$ D) $1 + 6e^6$ E) $-6e^6$

8. $f(x) = 3^{4x+5}$

$\Rightarrow$ **$f'\left(-\frac{5}{4}\right) = ?$**

A) 4 B) -4 C) $4 \ln 5$ D) $4^2 \ln 3$ E) $\ln 81$

9. $f(x) = 5^x \cdot e^{x^3+2}$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(h) - f(0)}{h} = ?$

A) e^2 B) $e^2 \cdot \ln 5$ C) $\ln 5$ D) 0 E) $1 + \ln 5$

10. $f(x) = e^{\ln(x^2+7)}$

$\Rightarrow f'(5!) = ?$

A) $5!^2$ B) 720 C) 480 D) 360 E) 240

11. $f(x) = \dfrac{\sin x}{e^x}$

$\Rightarrow f'(x) = ?$

A) $\dfrac{\cos x - \sin x}{e^x}$ B) $\dfrac{\sin x + \cos x}{e^x}$ C) $e^x \cdot \tan x$ D) $e^x \cdot \cot x$ E) 0

12. $f(x) = \sqrt{x + \sqrt{x}}$

$\Rightarrow \lim\limits_{x \to 1} \dfrac{f(x) - f(1)}{x - 1} = ?$

A) $\dfrac{3\sqrt{2}}{4}$ B) $\dfrac{3}{4}$ C) $\dfrac{\sqrt{2}}{4}$ D) $\dfrac{\sqrt{2}}{8}$ E) $\dfrac{3\sqrt{2}}{8}$

13. $f(x) = \text{arc}\sin(\sin(x^2 + 4))$

$\Rightarrow f'(1) = ?$

A) 1 B) 2 C) 3 D) 4 E) 16

14. $f(x) = \tan(\text{arc}\tan 3^x)$

$\Rightarrow f'(x) = ?$

A) 3^x B) 0 C) $3^x \cdot \ln 3$ D) $\sec x$ E) $\cot x$

15. $f(e^x) = 2\cos(\ln x)$

$\Rightarrow f'(e) = ?$

A) 0 B) $-\dfrac{2}{e^2}\sin 1$ C) e D) e^2 E) e^3

16. $f(x) = 3x + 4$

$\Rightarrow (f^{-1})'_{(17!)} = ?$

A) $\dfrac{1}{6}$ B) $\dfrac{1}{5}$ C) $\dfrac{1}{4}$ D) $\dfrac{1}{3}$ E) $\dfrac{1}{2}$

1-A 2-C 3-A 4-B 5-D 6-C 7-A 8-E 9-B 10-E 11-A 12-E 13-B 14-C 15-A 16-D

TEST 4

1. $f(x) = \log_3 x + \text{arc tan}x$

$g(x) = \text{arc cot}x$

$\Rightarrow (f + g)'_{(1)} = ?$

A) $\log_2 e$ B) $\ln 2$ C) $\log_3 e$ D) $\ln 3$ E) 0

2. $f(x) = e^{\sin^2 x}$

$g(x) = e^{\cos^2 x}$

$\Rightarrow (f \cdot g)'_{(2020!)} = ?$

A) 0 B) 2020 C) 2020!

D) – 2020 E) – 2020!

3. $P(x) = x^2 + ax + b$

$P(x) \mid (x-1)^2$

$-$

0

$\Rightarrow a \cdot b = ?$

A) – 3 B) – 2 C) – 1 D) 1 E) 2

4. $f(x) = \ln^3(\sin x)$

$\Rightarrow f'(x) = ?$

A) $3\ln^2(\sin x)$ B) $3\ln^2(\cos x)$

C) $3\ln^2(\sin 2x)$ D) $3\cot x \cdot \ln^2(\sin x)$

E) $3.\tan x \cdot \ln^2(\sin x)$

5. $f(x) = \ln^2(x^2 + 1) + \text{arc cot}x$

$\Rightarrow f'(1) = ?$

A) $\ln 4$ B) $\ln 4 + \tan x$ C) $-\frac{1}{2} + \ln 4$

D) $\frac{1}{2} + \ln 4$ E) $\sin x + \ln 4$

6. $f(x) = \text{arc sin}x + \text{arc cos}x$

$\Rightarrow f'(58) = ?$

A) 0 B) 18 C) 38 D) 58 E) 580

7. $f(x) = \text{arc tan}^2(x^2 + 5)$

$\Rightarrow f'(0) = ?$

A) 25 B) 15 C) 10 D) 5 E) 0

8. $y = x + 5$

$x = 4 + 4m$

$\Rightarrow \frac{dy}{dm} = ?$

A) 2 B) x C) m D) 4 E) 5

9. $y = 2x^2 + 3$

$x = m^2 - 3$

$m = 5n - 3$

$\Rightarrow \left.\frac{dy}{dn}\right|_{n=1} = ?$

A) 160 B) 140 C) 100 D) 80 E) 70

10. $y = 3t^2 + 4$

$x = 2t^3 + 10$

$\Rightarrow \frac{dy}{dx} = ?$

A) t^2 B) t C) t^{-1} D) t^{-2} E) t^{-3}

11. $y = \cos m$

$x = \sin m$

$\Rightarrow \left.\frac{dx}{dy}\right|_{m=\frac{\pi}{6}} = ?$

A) $-\frac{1}{\sqrt{3}}$ B) $-\sqrt{3}$ C) $\sqrt{3}$ D) $\frac{1}{\sqrt{3}}$ E) 0

12. $y = 5^k$

$x = \text{arc tank}$

$\Rightarrow \left.\frac{dy}{dx}\right|_{k=0} = ?$

A) 0 B) k C) ln50 D) ln5 E) lnk

13. $2x^2 - 3y^2 + 1 = 0$

$\Rightarrow \left.\frac{dy}{dx}\right|_{(1,1)} = ?$

A) $\frac{2}{3}$ B) 1 C) $\frac{3}{4}$ D) $\frac{4}{5}$ E) $\frac{5}{6}$

14. $x^3 . y + 3x^2 . y^2 = 0$

$\Rightarrow \left.\frac{dy}{dx}\right|_{(2,0)} = ?$

A) $\frac{1}{8}$ B) $\frac{1}{4}$ C) -1 D) $-\frac{1}{4}$ E) 0

15. $\sin x + \cos y + e^x = 0$

$\Rightarrow \frac{dy}{dx} = ?$

A) $\frac{e^x + \cos y}{\sin y}$ B) $\frac{e^x + \cos x}{\sin y}$ C) $\frac{-e^x - \cos x}{\sin y}$ D) e^x E) $\frac{e^x}{\sin y}$

16. $x^y + y^x = 0$

$\Rightarrow \frac{dy}{dx} = ?$

A) $\frac{x^y}{y^x}$ B) $-\frac{x^y}{y^x}$ C) $\frac{x^y . \ln x}{y^x . \ln y}$

D) $-\frac{y . x^{y-1} + y^x . \ln y}{x^y . \ln x + x . y^{x-1}}$ E) $\frac{y . x^{y-1} + y^x . \ln y}{x^y . \ln x + x . y^{x-1}}$

1-C 2-A 3-B 4-D 5-C 6-A 7-E 8-D 9-D 10-C 11-B 12-D 13-A 14-E 15-B 16-D

TEST 5

1. $f(x) = \log_3(2x - 1)$

$\Rightarrow \left(f^{-1}\right)'_{(1)} = ?$

A) $\ln\sqrt{27}$ B) $\ln 3$ C) $\frac{3}{2}$ D) $\log 3$ E) 0

2. $f: R \to R$

$f(3) = 7$

$f'(3) = 8$

$\Rightarrow \left(f^{-1}\right)'_{(7)} = ?$

A) $\frac{7}{3}$ B) $\frac{3}{7}$ C) $\frac{1}{3}$ D) $\frac{1}{7}$ E) $\frac{1}{8}$

3. $f(x) = x^{10} + e^x$

$\Rightarrow \frac{d^{10}f(x)}{dx^{10}} = ?$

A) 10! B) $10! + e^x$ C) e^x

D) 0 E) $\ln x + e^x$

4. $f: [-2, \infty) \to \left[-\frac{13}{4}, \infty\right)$

$x \neq 2$

$f(x) = x^2 - x - 3$

$\Rightarrow \left(f^{-1}\right)'_{(-1)} = ?$

A) $-\frac{2}{3}$ B) 1 C) $-\frac{1}{3}$ D) $\frac{1}{3}$ E) 1

5. $f(x) = \frac{3x + 4}{x - 1}$

$\Rightarrow \left(f^{-1}\right)'_{(x)} = ?$

A) -7 B) $-7(x-3)^{-2}$ C) $7(x-3)^{-2}$

D) $7(x-3)^2$ E) $-7(x-3)^2$

6. $f: R - \{4\} \to R - \{3\}$

$f(x) = \frac{ax + 1}{x - b}$

$\Rightarrow \left(f^{-1}\right)'_{(4)} = ?$

A) 11 B) 7 C) -7 D) -11 E) -13

7. $f(x) = \cot x$

$\Rightarrow \left(f^{-1}\right)'_{(1)} = ?$

A) $-\frac{1}{2}$ B) 1 C) $\frac{3}{2}$ D) $\frac{5}{2}$ E) 3

8. $f(x) = \sin x + e^{3x}$

$\Rightarrow \frac{d^{20}f(x)}{dx^{20}} = ?$

A) $\cos x + 3^{20} \cdot e^{3x}$ B) $-\sin x + 3^{20} \cdot e^{3x}$

C) $\sin x + 3^{20} \cdot e^{3x}$ D) $-\cos x + 3^{20} \cdot e^{3x}$

E) 0

9. $f(x) = x^x$

$\Rightarrow$ **$f'(x) = ?$**

A) 0 B) $x \cdot x^{x-1}$ C) $\ln x$

D) $x^x \cdot \ln x$ E) $x^x \cdot (1 + \ln x)$

10. $y = x^{\tan x}$

$\Rightarrow$ $\left.\frac{dy}{dx}\right|_{x=1} = ?$

A) tan1 B) cot1 C) 1 D) – 1 E) 0

11. $f(x) = \begin{cases} x^2 + 4, & x \geq 2 \\ 5x - 2, & x < 2 \end{cases}$

$\Rightarrow$ **$f'(2) = ?$**

A) 8 B) 5 C) 4 D) 1 E) ∅ (Yoktur)

12. $f(x) = \begin{cases} 2x^3 - 5, & x \geq 1 \\ 5x^2 + 4x, & x < 1 \end{cases}$

$\Rightarrow$ **$f'(2) + f'(0) = ?$**

A) 28 B) 20 C) 18 D) 10 E) ∅

13. $f(x) = \begin{cases} 4x + 10, & x \geq 1 \\ 2x^2 + m, & x < 1 \end{cases}$

f fonksiyonu 1 noktasında türevlenebilir.

Derivative of function f can be taken on point 1.

$\Rightarrow$ **$m = ?$**

A) 9 B) 10 C) 11 D) 12 E) 13

14. $f(x) = \begin{cases} 2x^2 + ax, & x \geq 1 \\ 4x - b, & x < 1 \end{cases}$

f fonksiyonu 1 noktasında türevlenebilir.

Derivative of function f can be taken on point 1.

$\Rightarrow$ **$a \cdot b = ?$**

A) 6 B) 4 C) 2 D) 1 E) 0

15. $f(x) = \begin{cases} 2x^5 - m, & x > 1 \\ n + 2, & x = 1 \\ 10x + 4, & x < 1 \end{cases}$

f fonksiyonu 1 noktasında türevlenebilir.

Derivative of function f can be taken on point 1.

$\Rightarrow$ **$m + n + f'(1) = ?$**

A) 9 B) 10 C) 11 D) 12 E) 13

16. $f(x) = (x + 1) \cdot (x - 3)^2$

$\Rightarrow$ **$(fof')_{(3)} = ?$**

A) 1 B) 3 C) 9 D) 18 E) 27

1-A 2-E 3-B 4-C 5-B 6-E 7-A 8-C 9-E 10-A 11-E 12-A 13-D 14-E 15-B 16-C

TEST 6

1. $f(x) = |x^2 + 1| + |x - 3|$

$\Rightarrow$ **f'(2) = ?**

A) 1 B) 2 C) 3 D) 4 E) 0

2. $f(x) = |x^2 - 9x|$

$f(x) = y$

$\Rightarrow \left.\frac{dy}{dx}\right|_{x=3} = ?$

A) 3 B) 2 C) 0 D) – 2 E) – 3

3. $y = |\sin x - \cos x|$

$\Rightarrow \left.\frac{dy}{dx}\right|_{x=\frac{\pi}{3}} = ?$

A) $\frac{\sqrt{2}}{2}$ B) $\frac{1-\sqrt{3}}{2}$ C) $\frac{\sqrt{3}-1}{2}$ D) 0 E) $\frac{\sqrt{3}+1}{2}$

4. $f(x) = x^2 \cdot |x|$

$\Rightarrow$ **f'(0) = ?**

A) Ø B) 11 C) $3x^2$ D) 13 E) 0

5. $f(x) = |x^2 - 6x + 9| + x^2 - 5$

$\Rightarrow$ **f'(3) = ?**

A) 0 B) 3 C) 6 D) 8 E) 9

6. $f(x) = x \cdot \text{sgn}(x - 3) + |x - 1|$

$\Rightarrow \lim_{x \to 2} \frac{f(x) - f(2)}{x - 2} = ?$

A) 0 B) 1 C) 4 D) 16 E) 64

7. $f(x) = 5x^3 \cdot \text{sgn}(x - 6)$

$\Rightarrow$ **f'(2) = ?**

A) 120 B) 60 C) 0 D) – 60 E) – 120

8. $f(x) = [\![x]\!]$

$\Rightarrow \lim_{h \to 0} \frac{f(h + 4) - f(4)}{h} = ?$

A) 3 B) 5 C) 7 D) 9 E) Ø

9. $f(x) = [\![x - 5]\!]$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f\left(h + \frac{5}{2}\right) - f\left(\frac{5}{2}\right)}{h} = ?$

A) 10 B) 0 C) $-\frac{5}{2}$ D) -5 E) -15

10. $f(x) = \sqrt{x} + \arctan x$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(1-h) - f(1-2h)}{h} = ?$

A) $\frac{3}{2}$ B) $\frac{1}{2}$ C) 1 D) $-\frac{1}{2}$ E) $-\frac{3}{2}$

11. $f(x) = \dfrac{x}{\sqrt{x} - 1}$

$g(x) = \dfrac{1}{\sqrt{x} - 1}$

$\Rightarrow \lim\limits_{h \to 0} \dfrac{f(h) - g(h) - 1}{h} = ?$

A) 0 B) $\sqrt{x} + 1$ C) $x\sqrt{x}$

D) $\dfrac{1}{2\sqrt{x}}$ E) $1 + \dfrac{1}{2\sqrt{x}}$

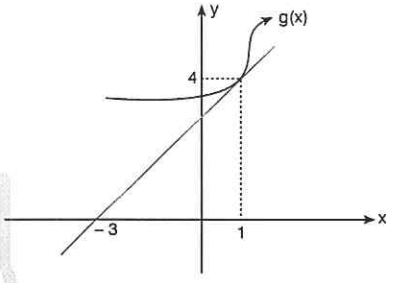
12. $\lim\limits_{x \to 0^+} (x^x) = ?$

A) 1 B) 0 C) -1 D) -2 E) ∞

13. $\lim\limits_{x \to \infty} \dfrac{e^x}{x^2 + 7} = ?$

A) ∞ B) 0 C) 1 D) -1 E) 2

14.



$f(2x - 1) = x \cdot g(x) - 3$

$\Rightarrow f'(1) = ?$

A) 4 B) 5 C) $\frac{5}{2}$ D) 2 E) 1

15. $f: R \to R$

$f(x) = 5\sin x + 12\cos x$

$\Rightarrow \max[f(x)] = ?$

A) 17 B) 13 C) 12 D) 11 E) 10

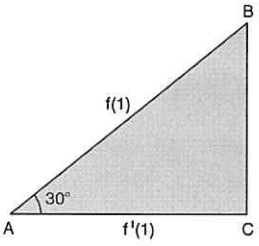
1-C 2-A 3-E 4-E 5-C 6-A 7-D 8-E 9-B 10-C 11-D 12-A 13-A 14-C 15-B

1. ABC bir üçgen

ABC is a triangle

$m(\widehat{A}) = 30°$

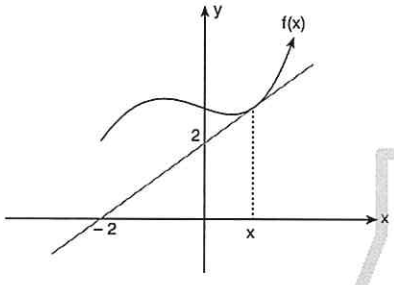
$f(x) = 2x^3 - 5x + 7$



$\Rightarrow$ **A(ABC) = ?**

A) $\frac{1}{4}$ B) $\frac{1}{3}$ C) $\frac{1}{2}$ D) 1 E) 2

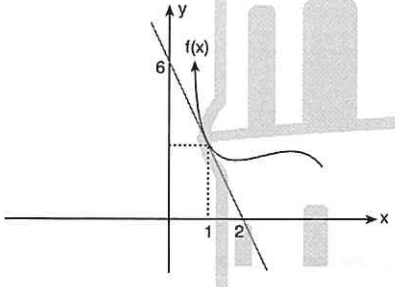
2.



$\Rightarrow \lim_{h \to 0} \frac{f(x+h) - f(x)}{h} = ?$

A) – 2 B) 2 C) 1 D) $\frac{1}{2}$ E) 0

3.



$\Rightarrow \lim_{x \to 1} \frac{f(x) - f(1)}{x - 1} = ?$

A) – 3 B) – 2 C) 1 D) 2 E) 3

4. $f(x, m) = 2x^2 + 3m^2 + 4x + m$

$\Rightarrow \frac{d\,f(x, m)}{dx} - \frac{d\,f(x, m)}{dm} = ?$

A) 4x – 6m B) 4x + 6m

C) 4x – 6m – 3 D) 2x – 6m + 3

E) 4x – 6m + 3

5. $f(x) = x^3 + mx^2 + nx + k$

$f(0) = 1$

$f'(0) = 2$

$f''(0) = -4$

$\Rightarrow$ **f(3) = ?**

A) 17 B) 16 C) 15 D) 14 E) 13

6. $f(x) = \sin x + \cos x + e^x$

$\Rightarrow$ **f'(x) – f(x) = ?**

A) sin2x B) – sin2x C) 2cosx

D) 2sinx E) – 2sinx

7. $f(x) = 2x^3 + ax^2 - 4x + 5$

$f'(x) = bx^2 + 10x + c$

$\Rightarrow$ **a + b + c = ?**

A) 5 B) 6 C) 7 D) 8 E) 9

8. $f(x) = \frac{g(x)}{h(x)}$

$g(2) = 3$

$g'(2) = 8$

$h(2) = 2$

$h'(2) = 4$

$\Rightarrow$ **$f'(2) = ?$**

A) 1 B) 2 C) 3 D) 4 E) 5

9. $f(x) = (2x - 3)^2$

$g(x) = x^2$

$h(x) = \sqrt{x}$

$\Rightarrow$ **$(fogoh)'_{(2)} = ?$**

A) 0 B) 1 C) 2 D) 4 E) 8

10. $f(x) = \sin x - \cos x$

$f^{(703)}(x)$ in $f(x)$ türünden değeri aşağıdakilerden hangisidir?

Which of the following is the value of $f^{(703)}(x)$ of $f(x)$ type?

A) $\cos x + \sin x$ B) $-\sin x + \cos x$

C) $-\cos x - \sin x$ D) $\sin x - \cos x$

E) 0

11. $F(x, y) = \ln(x \cdot y) + x^2y = \ln 2 + 2$

$\Rightarrow$ **$F'(1, 2) = ?$**

A) $-\frac{10}{3}$ B) -10 C) $\frac{10}{3}$ D) 10 E) 2

12. $y = x^4 + 5x^3 + 2x - 4$

$\Rightarrow$ **$\frac{d^3y}{dx^3} = ?$**

A) $24x + 15$ B) $24x + 30$ C) $24x + 32$

D) $12x^2 + 30$ E) $15x + 32$

13. $f'(7) = 10$

$\Rightarrow$ **$\lim_{h \to 0} \frac{f(7 + 2h) - f(7 - 4h)}{3h} = ?$**

A) 3 B) 5 C) 10 D) 15 E) 20

14. $x = m^2 - 2m$

$y = m^3 - 8m + 1$

$\Rightarrow$ **$\left.\frac{d^2y}{dx^2}\right|_{m=2} = ?$**

A) 1 B) 2 C) 4 D) 5 E) 0

1-D 2-C 3-A 4-E 5-B 6-E 7-C 8-A 9-D 10-C 11-A 12-B 13-E 14-B

1. $P(x) + P'(x) = x^2 + 4x + 5$

P(x) polinomunun katsayılar toplamı kaçtır?

What is the sum of coefficients of P(x) polynomial?

A) 6 B) 5 C) 4 D) 3 E) 2

2. $x \cdot y + \ln y = e^x + 1$

$y = f(x)$

$\Rightarrow$ **$f'(1) = ?$**

A) -1 B) 0 C) 0,5 D) 1 E) 2

3. $f(x) = \dfrac{d(\cos x - x)}{d(\sin x - 3)}$

$\Rightarrow$ **$f'\left(\dfrac{\pi}{6}\right) = ?$**

A) $-\sqrt{3}$ B) $-\dfrac{\sqrt{3}}{2}$ C) $\sqrt{3}$ D) -1 E) -2

4. $\lim\limits_{x \to 1} \dfrac{a - f(x)}{ax - a} = 1$

$\Rightarrow$ **$f(1) - f'(1) = ?$**

A) $-2a$ B) $-a$ C) 0 D) a E) $2a$

5. $P(x) = a_n x^n + a_{n-1} \cdot x^{n-1} + \ldots + a_1 x + a_0$

$x \cdot P(x) = P'(x) \cdot P''(x)$

$\Rightarrow$ **$a_n = ?$**

A) $\dfrac{1}{6}$ B) $\dfrac{1}{8}$ C) $\dfrac{1}{16}$ D) $\dfrac{1}{48}$ E) $\dfrac{2}{3}$

6. $y = \cos 3t$

$x = \sin 3t$

$f(x) = \dfrac{dx}{dy}$

$\Rightarrow$ **$f(0, 5) = ?$**

A) $-\sqrt{3}$ B) $-\dfrac{1}{2}$ C) 0 D) $\dfrac{1}{2}$ E) $\sqrt{3}$

7. $h(x) + h(x \cdot \ln x) = 3x^2 + 1$

$\Rightarrow$ **$h'(e) = ?$**

A) 3e B) 2e C) e D) 6 E) 0

8. $f(x) = \lim\limits_{h \to 0} \dfrac{\sin(2x + 2h) - \sin 2x}{h}$

$\Rightarrow$ **$f(0) = ?$**

A) sin2 B) 4 C) 2 D) 1 E) cos2

9. $f(ax + 1) = x^3$

$\Rightarrow \dfrac{f(6)}{f'(6)} = ?$

A) $\dfrac{3}{5}$ B) $\dfrac{2}{5}$ C) 1 D) $\dfrac{5}{2}$ E) $\dfrac{5}{3}$

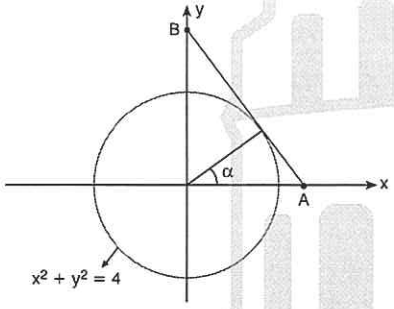
10. $|x| < 1$

$1 + x + x^2 + \ldots x^n = \dfrac{1}{1 - x}$

$\Rightarrow 1 + 2 \cdot \left(\dfrac{1}{3}\right) + 3 \cdot \left(\dfrac{1}{3}\right)^2 + 4 \cdot \left(\dfrac{1}{3}\right)^3 + \ldots = ?$

A) $\dfrac{3}{4}$ B) $\dfrac{9}{4}$ C) $\dfrac{3}{2}$ D) $\dfrac{9}{2}$ E) 1

11.



A(x, 0)

$\lim\limits_{x \to \infty} \dfrac{\tan\alpha}{x} = ?$

A) $\dfrac{1}{2}$ B) $\dfrac{1}{3}$ C) 1 D) 2 E) 3

12. $\lim\limits_{h \to 0} \left(\dfrac{f(x + h) - f(x - 5h)}{h}\right) = ?$

A) $-4f'(x)$ B) $-2f'(x)$ C) $2f'(x)$ D) $4f'(x)$ E) $6f'(x)$

13. $f(x) = x^2 + 2x + 3$

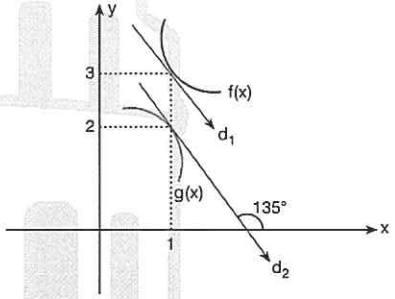
$g(x) = 2x + 1$

$(fog)'_{(2)} = (gof)'_{(k)}$

$\Rightarrow k = ?$

A) 3 B) 4 C) 5 D) 6 E) 7

14.



$d_1 \,//\, d_2$

$h(x) = \dfrac{f^2(x)}{g(x)}$

$\Rightarrow h'(1) = ?$

A) $-\dfrac{3}{4}$ B) $-\dfrac{21}{4}$ C) $\dfrac{21}{4}$ D) $\dfrac{3}{4}$ E) 0

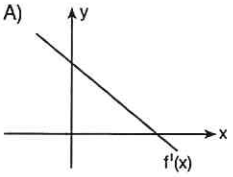
1-A 2-B 3-E 4-E 5-D 6-A 7-B 8-C 9-E 10-B 11-A 12-E 13-C 14-A

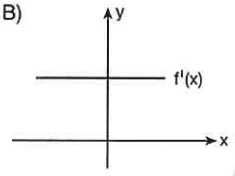
1. $f: R \to R \quad Ax, y \in R$

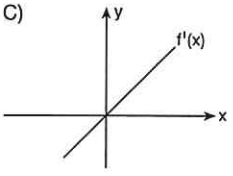
$f(x + y) = f(x) + f(y)$

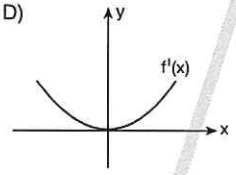
$f'(x)$ fonksiyonunun grafiği aşağıdakilerden hangisi olabilir?

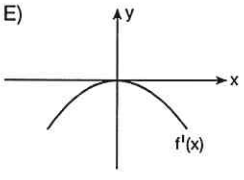
Which of the following is the graph of the $f'(x)$ function?

A) 

B) 

C) 

D) 

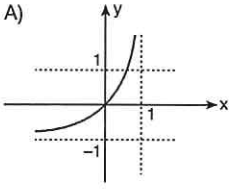
E) 

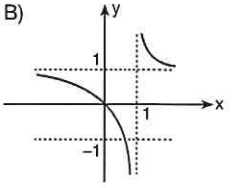
3. $y = \dfrac{x}{|x-1|}$

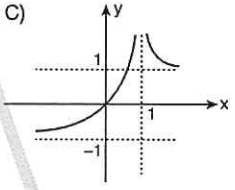
$f(x) = y$

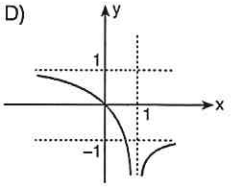
$f(x)$ fonksiyonunun grafiği aşağıdakilerden hangisi olabilir?

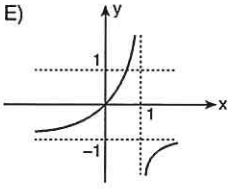
Which of the following is the graph of the $f(x)$ function?

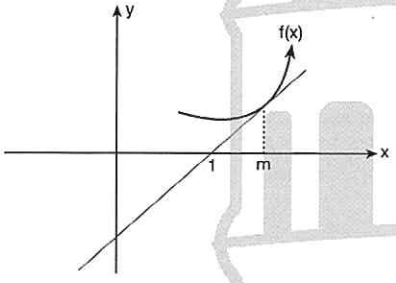
A) 

B) 

C) 

D) 

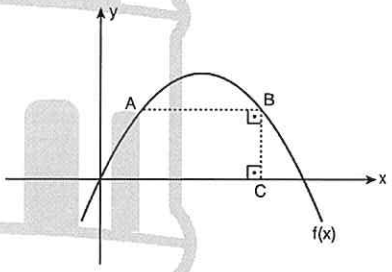
E) 

2. 

$f'(m) = 2f(m)$

$\Rightarrow$ **m = ?**

A) $\frac{3}{2}$ B) $\frac{1}{2}$ C) 1 D) $-\frac{1}{2}$ E) $-\frac{3}{2}$

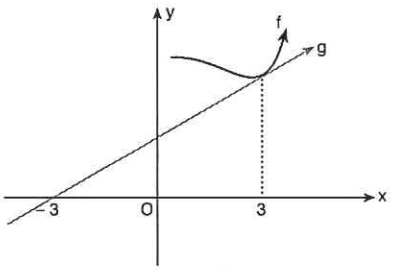
4. 

$f(x) = 12x - x^2$

$\Rightarrow$ **max(|AB| + |BC|) = ?**

A) 35 B) 36 C) 37 D) 47 E) 50

5.



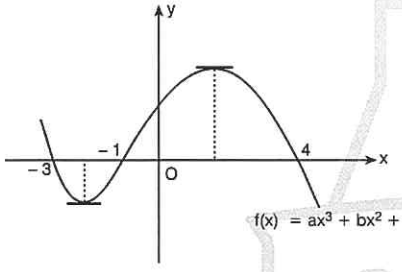
$$\lim_{x \to 3} \left(\frac{x \cdot f(x) + g(x) - 4}{x - 3} \right) = a$$

$a \in R$

$\Rightarrow$ **a = ?**

A) 2 B) $\frac{5}{3}$ C) $\frac{7}{2}$ D) $\frac{7}{3}$ E) 8

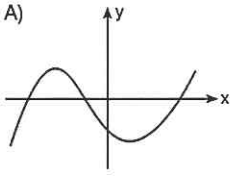
6.



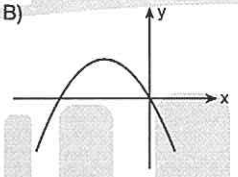
$f(x) = ax^3 + bx^2 + cx + d$

$\Rightarrow$ **graf(f''(x)) = ?**

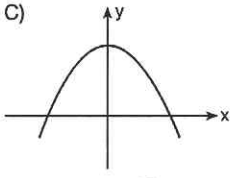
A)



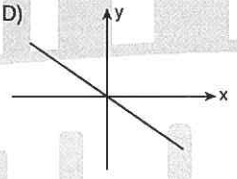
B)



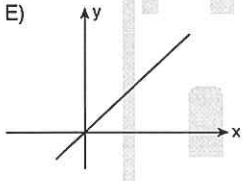
C)



D)



E)



7. $f(x + 2y) - f(x) = y^2 + 4y + x \cdot y$

$\Rightarrow$ **f'(x) = ?**

A) x + 2 B) x + 4 C) $\frac{x + 4}{2}$

D) x + 6 E) $\frac{x^2 + 1}{2}$

8. $f'(x) = -\frac{1}{1 + x^2}$

$\Rightarrow$ **f(x) = ?**

A) arc sinx B) arc cosx C) arc cotx

D) sinx E) arc tanx

9. $f(x) = \text{arc sin}\frac{1}{2} + \ln 2$

$\Rightarrow$ **f'(x) = ?**

A) 0 B) $\frac{1}{2}$ C) $\frac{1}{4}$ D) e^2 E) e^3

10. $f(x) = \ln(\sin x) + \ln(\cos x)$

$\Rightarrow$ **f'(x) = ?**

A) 2.tan2x B) 2.cot2x C) sin2x

D) tan2x E) cot2x

1-B 2-A 3-C 4-C 5-B 6-D 7-C 8-C 9-A 10-B

1. $2f(x) + f\left(\frac{\pi}{2} - x\right) = \frac{\sin x}{\cos x}$

$\Rightarrow f'\left(\frac{\pi}{4}\right) = ?$

A) 10 B) 8 C) 6 D) 4 E) 2

2. $f(x) = \left[1 + (x + x^2)^3\right]^4$

$f'(1) = 2^a \cdot 3^b \cdot 5^c$

$\Rightarrow a + b + c = ?$

A) 13 B) 12 C) 11 D) 10 E) 9

3. f: R → R

$f'(x) = x^2 + x + 1$

$f(3) = 5$

$\Rightarrow \lim\limits_{x \to 3} \frac{f(x) - 5}{x - 3} = ?$

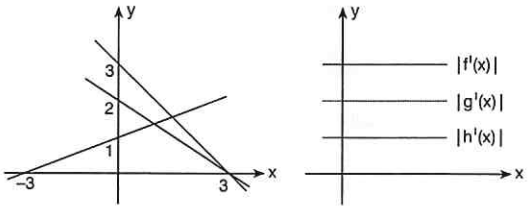
A) 19 B) 17 C) 15 D) 13 E) 7

4. $y = \ln(\sin^2 x + e^{2x})$

$\Rightarrow \left.\frac{dy}{dx}\right|_{x=0} = ?$

A) 2 B) 3 C) 4 D) 5 E) 6

5.



f(0), g(0) ve h(0) için aşağıdakilerden hangisi doğrudur?

Which of the followings expression of f(0), g(0) ve h(0) is correct?

A) f(0) < h(0) < g(0) B) g(0) < f(0) < h(0)

C) h(0) < f(0) < g(0) D) g(0) < h(0) < f(0)

E) h(0) < g(0) < f(0)

6. f: R → R

$f(x) = x^2 + 2x - 4$

$g'(2) = 0$

$(gof)'(m) = 0$

$\Rightarrow \Sigma m = ?$

A) – 5 B) – 4 C) – 3 D) – 2 E) 0

7. $f(x) = g(x^2) + kx^3$

$f'(-2) = g'(4) = 2$

$\Rightarrow k = ?$

A) $\frac{1}{3}$ B) $\frac{1}{2}$ C) $\frac{2}{3}$ D) $\frac{5}{6}$ E) 1

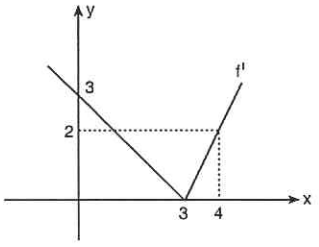
8. f: R → R

$f(x) = \sin\left(\frac{x}{2}\right)$

⇒ $(fof)'_{(2\pi)} = ?$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $-\frac{1}{4}$ D) $\frac{1}{4}$ E) -1

9.



f(1), f(2) ve f(3) için aşağıdakilerden hangisi doğrudur?

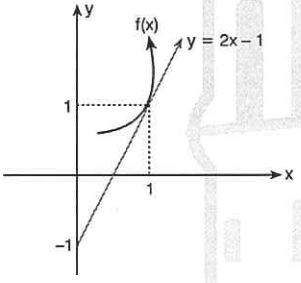
Which of the followings expression of f(1), f(2) ve f(3) is correct?

A) f(1) > f(2) > f(3) B) f(3) > f(2) > f(1)

C) f(1) > f(3) > f(2) D) f(2) > f(1) > f(3)

E) f(2) > f(3) > f(1)

10. m, n ∈ R



$f(x) = \ln x^a + bx^2 + 3$

⇒ **a + b = ?**

A) – 6 B) – 4 C) 0 D) 4 E) 6

11. $f(x) = e^x \cdot \cos x$

⇒ $f^{(12)}(0) = ?$

A) – 64 B) – 16 C) 0 D) 16 E) 64

12. $f(x) = (x + 1) \cdot (x + 2) \cdot (x + 3) \cdot (x + 4)$

⇒ $\frac{f'(1)}{f(1)} = ?$

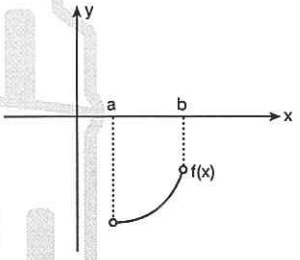
A) $\frac{77}{60}$ B) $\frac{33}{53}$ C) $\frac{11}{17}$ D) $\frac{3}{7}$ E) 1

13. $f(x) = 3x^3 + 2x^2 + x + 1$

⇒ $\lim_{h \to 0} \frac{f'(1 + h) - f'(1)}{h} = ?$

A) 11 B) 14 C) 18 D) 22 E) 24

14.



f(x), f'(x) ve f''(x) için aşağıdakilerden hangisidir?

Which of the followings expressions of f(x), f'(x) and f''(x) is correct?

	f(x)	f'(x)	f''(x)
A)	+	+	+
B)	–	+	+
C)	–	+	–
D)	–	–	–
E)	+	–	+

1-E 2-B 3-D 4-A 5-E 6-C 7-D 8-C 9-B 10-D 11-A 12-A 13-D 14-B

ÜNİTE 14

Unit 14

İntegral / Integral

TEST 1

1. $\int (x+2)^2\,dx = ?$

A) $x^2 + 4x + 4 + c$ B) $\frac{x^3}{3} + 2x^2 + c$

C) $\frac{x^3}{3} + 2x^2 + 4x + c$ D) $x + c$

E) $x^2 + c$

2. $\int (x^2 + 2)\,dx = ?$

A) $2x + c$ B) $\frac{x^3}{3} + 2x + c$ C) $2x^2 + c$

D) $\frac{x^3}{3} + 2x^2 + c$ E) $x + c$

3. $\int \left(7x^6 + \frac{1}{x^2}\right) dx = ?$

A) $x^7 - \frac{1}{x} + c$ B) $x^7 + \frac{1}{x} + c$ C) $x^7 + x + c$

D) $x^7 - x + c$ E) $x^7 + x^2 + c$

4. $\int (\sqrt{x} + \sqrt[3]{x})\,dx = ?$

A) $\frac{3}{2}\sqrt{x^3} + \frac{4}{3}\sqrt[3]{x^4} + c$ B) $\frac{3}{2}\sqrt[3]{x^2} + \frac{4}{3}\sqrt[4]{x^3} + c$

C) $\frac{1}{2\sqrt{x}} + \frac{1}{3\sqrt[3]{x^2}} + c$ D) $2\sqrt{x} + 3\sqrt[3]{x^2} + c$

E) $\frac{2}{3}\sqrt{x^3} + \frac{3}{4}\sqrt[3]{x^4} + c$

5. $\int (x^{-1} - x^{-2})\,dx = ?$

A) $\ln|x| - \frac{2}{x^3} + c$ B) $\ln|x| - \frac{1}{x} + c$

C) $-\frac{1}{x^2} - \frac{1}{x} + c$ D) $\ln|x| + \frac{1}{x} + c$

E) $x^2 + x + c$

6. $\int x\,dy + \int y\,dz + \int z\,dx = ?$

A) $xy + yz + zx$ B) $\frac{x^2}{2} + \frac{x^2}{2} + \frac{x^2}{2} + c$

C) $yx + zy + xz + c$ D) 0

E) $x^2 + y^2 + z^2 + c$

7. $\int (\sin x + \cos x)\,dx = ?$

A) $\sin x + \cos x + c$ B) $\sin x - \cos x + c$

C) $\tan x + c$ D) $\cot x + c$

E) $\sec x + c$

8. $\int (1 + \tan^2 x)\,dx = ?$

A) $\tan x + c$ B) $\text{arc}\tan x + c$

C) $\cot x + c$ D) $\text{arc}\cot x + c$

E) $\sin x + \cos x + c$

9. $\int (e^x + 5x^4)\,dx = ?$

A) $e^x + x^4 + c$ B) $e^x + c$ C) $x^4 + c$

D) $e^x + x^5 + c$ E) $x^5 \cdot e^x + c$

10. $\int 5^x\,dx = ?$

A) $5^x + c$ B) $\frac{5^x}{\ln 5} + c$ C) $5^x \cdot \ln 5 + c$

D) $\ln 5 + c$ E) $\sqrt[5]{x} + c$

11. $\int \left(\frac{4x^4 + 5x^5 + 6x^6}{x}\right) dx = ?$

A) $4x^3 + 5x^4 + 6x^5 + c$

B) $12x^2 + 20x^3 + 30x^4 + c$

C) $x^4 + x^5 + x^6 + c$

D) $x^3 + x^4 + x^5 + c$

E) $x^{15} + c$

12. $\int \left(34 \cdot \frac{x^8}{x^{-8}} + \frac{x}{x^2}\right) dx = ?$

A) $x^{17} + \frac{1}{x} + c$ B) $x^{17} + \ln|x| + c$

C) $\ln|x| + \frac{1}{x} + c$ D) $\ln|x| + 2x^{17} + c$

E) $2\ln|x| + 2x^{17} + c$

13. $\frac{d}{dx}\int (x^3 + 3x)\,dx = ?$

A) $x^3 + 3x + c$ B) $\frac{x^4}{4} + \frac{3x^2}{2} + c$ C) $x^3 + 3x$

D) $3x^2 + 3$ E) 0

14. $f(x) = x^3 + 3x$

$\Rightarrow \int f'(x)\,dx = ?$

A) $x^3 + 3x + c$ B) $x^3 + 3x$ C) $3x^2 + 3 + c$

D) $3x^2 + 3$ E) 0

15. $\int \left[\frac{f'(x) \cdot g(x) - g'(x) \cdot f(x)}{g^2(x)}\right] dx = ?$

A) $f(x) \cdot g(x) + c$ B) $f(x) + g(x) + c$

C) $f(x) - g(x) + c$ D) $\left(\frac{g}{f}\right)(x) + c$

E) $\left(\frac{f}{g}\right)(x) + c$

16. $\int [f'(x) \cdot g(x) + g'(x) \cdot f(x)]\,dx = ?$

A) $(f + g)_{(x)} + c$ B) $(f - g)_{(x)} + c$ C) $(f \cdot g)_{(x)} + c$

D) $(fog)_{(x)} + c$ E) $\left(\frac{f}{g}\right)_{(x)} + c$

1-C 2-B 3-A 4-E 5-D 6-C 7-B 8-A 9-D 10-B 11-C 12-D 13-C 14-A 15-E 16-C

TEST 2

1. $\int f(x)\,dx = x^3 + 4x^2 + 1$

$\Rightarrow$ **f(2) = ?**

A) 20 B) 26 C) 28 D) 30 E) 32

2. **$d(t^3 + 5t^2)$ = ?**

A) $3t^2 + 10t$ B) $(3t^2 + 10t)\,dx$ C) $3t^2\,dt$

D) $(3t^2 + 10t)\,dt$ E) 0

3. $\int d(x^3 + 5x)$ **= ?**

A) $x^3 + 5x + c$ B) $x^3 + 5x$ C) $x^3\,dx$

D) $(x^3 + 5x)\,dx$ E) 0

4. $\int (x^3 + 3^x)\,dx$ **= ?**

A) $x^3 + c$ B) $\ln 4x + c$ C) $3x^2 + 3^x \ln 3 + c$

D) $\frac{x^4}{4} + \frac{3^x}{\ln 3} + c$ E) $\frac{x^4}{4} + 3^x + c$

5. $\int \left(e^{7x} + \frac{1}{x}\right) dx$ **= ?**

A) $e^{7x} + \ln|x| + c$ B) $e^{7x} + \ln|x| + c$

C) $7e^{7x} + \ln|x| + c$ D) $7e^{7x} - \ln|x| + c$

E) $\frac{e^{7x}}{7} + \ln|x| + c$

6. $\int (10e^{5y} + 12\cos 3y)\,dy$ **= ?**

A) $2e^{5y} + 4\sin 3y + c$ B) $2e^{5x} + 4\sin 3x + c$

C) 0 D) $5e^{2y} + 3\sin 3y + c$

E) $2e^{5y} - 4\sin 3y + c$

7. $\int (\ln 3)\,dz$ **= ?**

A) $x.\ln 3 + c$ B) $\ln 3 + c$ C) $\ln 3^z + c$

D) $\ln z^3 + c$ E) $-\ln 3^x + c$

8. $\int (e^x + 4)\,dx$ **= ?**

A) $e^x + 4x + c$ B) $e^x + c$ C) $e^x - 4x + c$

D) $e^x + x^4 + c$ E) $e^x - x^4 + c$

9. $f'(x) = 5x^4 + 7x^6 - 8x^7$

$\Rightarrow$ **f(x) = ?**

A) $x^5 + x^7 + x^8 + c$ B) $x^5 - x^7 + x^8 + c$

C) $x^5 + x^7 - x^8 + c$ D) $\frac{x^5}{5} + \frac{x^6}{6} - \frac{x^7}{7} + c$

E) $20x^3 + 42x^5 - 56x^6 + c$

10. $\int [f'(x) + f''(x) + f'''(x)]\, dy = ?$

A) $f'(x) + c$ B) $f''(x) + c$

C) $f'''(x) + c$ D) $f(x) + f'(x) + c$

E) $f(x) + f'(x) + f''(x) + c$

11. $\int \frac{x\sqrt{x}}{\sqrt[5]{x^2}}\, dx = ?$

A) $\frac{3}{5}x^{\frac{3}{5}} + c$ B) $\frac{5}{3}x^{\frac{5}{3}} + c$ C) $\frac{21}{10}x^{\frac{21}{10}} + c$

D) $\frac{10}{21}x^{\frac{21}{10}} + c$ E) $\ln|x| + c$

12. $\int \frac{x^7 \cdot x^8 \cdot x^{11}}{x^{27}}\, dx = ?$

A) $\ln|x| + c$ B) $\frac{1}{x} + c$ C) $x + c$

D) $x^2 + c$ E) $x^3 + c$

13. $f(x) = \int (3x^2 + 1)\, dx$

$f(0) = 5$

$\Rightarrow$ **f(2) = ?**

A) 14 B) 15 C) 16 D) 17 E) 18

14. $\int \frac{dx}{1 + x^2} + \int (1 + \tan^2 x)\, dx = ?$

A) arc sinx + tanx + c

B) arc cosx + tanx + c

C) arc tanx + tanx + c

D) arc tanx + cotx + c

E) arc cosx + cosx + c

15. $\int -\frac{dx}{1 + x^2} + \int -\frac{dx}{\sqrt{1 - x^2}} = ?$

A) arc tanx + arc sinx + c

B) arc cotx + arc cosx + c

C) tanx + sinx + c

D) cotx + cosx + c

E) arc cotx + arc tanx + c

16. $\int 3m \cdot d(m^2 + 1) = ?$

A) $2m^3 + c$ B) $m^3 + c$ C) $2x^3 + c$

D) $3m^3 + c$ E) $-2m^3 + c$

1-C 2-D 3-A 4-D 5-E 6-A 7-C 8-A 9-C 10-E 11-D 12-A 13-B 14-C 15-B 16-A

TEST 3

1. $\int \frac{x^{10}-1}{x^5-1}\,dx = ?$

A) $x^5 + c$ B) $x^5 + 1 + c$ C) $\frac{x^6}{6} + x + c$

D) $\frac{x^6}{6} + c$ E) $\frac{x^6}{6} - x + c$

2. $\int \frac{x-1}{\sqrt{x}+1}\,dx = ?$

A) $\frac{2}{3}x\sqrt{x} - x + c$ B) $\frac{2}{3}x\sqrt{x} + x + c$

C) $\frac{3}{2}x\sqrt{x} + x + c$ D) $\frac{3}{2}x\sqrt{x} - x + c$

E) $\sqrt{x} - x + c$

3. $\int \frac{1}{\cos^2 x}\,dx = ?$

A) $\sin x + c$ B) $\cos x + c$ C) $\cot x + c$

D) $\tan x + c$ E) $\operatorname{cosec} x + c$

4. $\int \left(\frac{x^2-5x+6}{x-2}\right)dx = ?$

A) $x - 3 + c$ B) $\frac{x^2}{2} - 3x + c$

C) $\frac{x^2}{2} + 3x + c$ D) $x^2 + 3x + c$

E) $x^2 - 3x + c$

5. $\int (\sin 5x + \cos 3x)\,dx = ?$

A) $\sin 3x + \cos 5x + c$ B) $\sin 3x - \cos 5x + c$

C) $\frac{\sin 3x}{3} - \frac{\cos 5x}{5} + c$ D) $\frac{\sin x}{3} - \frac{\cos 5x}{5} + c$

E) $\tan 5x + \cot 3x + c$

6. $\int \left(\frac{\sin^2 x + \cos^2 x}{\sin^2 x}\right)dx = ?$

A) $-\cot x + c$ B) $\cot x + c$ C) $-\tan x + c$

D) $\tan x + c$ E) $\sin x + c$

7. $\int \left(\frac{\sin^2 x + \cos^2 x}{\tan x \,.\, \cot x}\right)dx = ?$

A) $\sin x + c$ B) $\cos x + c$ C) $x + c$

D) $x^2 + c$ E) $\sin x \,.\, \cos x + c$

8. $\int dx + \int dy + \int dz = ?$

A) $x + y + z$ B) $x^2 + y^2 + z^2 + c$

C) c D) $x + y + z + c$

E) $\sqrt{x} + \sqrt{y} + \sqrt{z} + c$

9. $\int (x-4)^4\,dx = ?$

A) $5(x-4)^4 + c$ B) $-5(x-4)^4 + c$

C) $\frac{(x-4)^5}{5} + c$ D) $\frac{(x+4)^5}{5} + c$

E) $5(x+7)^4 + c$

10. $\int (3x+7)^2\,dx = ?$

A) $\frac{(3x+7)^3}{9} + c$ B) $\frac{(3x+7)^3}{3} + c$

C) $(3x+7)^3 + c$ D) $(3x-7)^3 + c$

E) $\frac{(3x-7)^3}{93} + c$

11. $\int \sqrt{x+1}\,dx = ?$

A) $\sqrt[3]{x+1} + c$ B) $\sqrt[3]{x-1} + c$

C) $x\sqrt{x} + c$ D) $\frac{3}{2}\sqrt{(x+1)^3} + c$

E) $\frac{2}{3}\sqrt{(x+1)^3} + c$

12. $\int \cot x\,dx = ?$

A) $\ln|\tan x| + c$ B) $\ln|\sec x| + c$

C) $\ln|\sin x| + c$ D) $\ln|\cos x| + c$

E) $\ln|x| + c$

13. $\int (\tan^2 x)\,dx = ?$

A) $\sin x + c$ B) $\cos x + x + c$

C) $\tan x + x + c$ D) $\tan x - x + c$

E) arc $\tan x + x + c$

14. $\int \frac{e^x}{e^x + 8}\,dx = ?$

A) $\ln|e^x| + c$ B) $\ln|e^x + 8| + c$

C) $\ln|x| + c$ D) $(e^x + 8)x + c$

E) $(e^x - 8)x + c$

15. $\int \sin^3 x \cdot \cos x\,dx = ?$

A) $\frac{\sin^4 x}{4} + c$ B) $\frac{\cos^4 x}{4} + c$ C) $-\frac{\sin^4 x}{4} + c$

D) $-\frac{\cos^4 x}{4} + c$ E) $\frac{\sin^4 x}{\cos^2 x} + c$

16. $\int \frac{\ln x}{x}\,dx = ?$

A) $\ln|x| + c$ B) $\ln\left|\frac{1}{x}\right| + c$

C) $\ln^2|x| + c$ D) $\frac{1}{2}\ln^2|x| + c$

E) $\ln|\sqrt{x}| + c$

1-C 2-A 3-D 4-B 5-C 6-A 7-C 8-D 9-C 10-A 11-E 12-C 13-D 14-B 15-A 16-D

TEST 4

1. $\int \frac{\sin 2x}{2 + \sin^2 x}\,dx = ?$

A) $\ln|x^2 + 2| + c$ B) $\ln|2 + \sin^2 x| + c$

C) $\ln|x^2 - 2| + c$ D) $\ln|2 - \sin^2 x| + c$

E) $\ln|\sin x| + c$

2. $\int \frac{\sqrt{3}}{1 + 3x^2}\,dx = ?$

A) $\arctan 3x + c$ B) $\arctan(\sqrt{3} \cdot x) + c$

C) $\arctan \sqrt{3x} + c$ D) $\arctan x^3 + c$

E) $\ln|\tan x| + c$

3. $\int \frac{1}{\sqrt{1 - 25x^2}}\,dx = ?$

A) $\frac{1}{5}\arcsin 5x + c$ B) $\tan 5x + c$

C) $\arctan 5x + c$ D) $5\arcsin 5x + c$

E) $\tan^2 x + c$

4. $\int \frac{dx}{1 + 16x^2} = ?$

A) $\frac{1}{4}\arctan 4x + c$ B) $\tan 4x + c$

C) $\arctan 4x + c$ D) $4\arctan 4x + c$

E) $\tan^2 x + c$

5. $\int (x^2 + 5x)^6 \cdot (2x + 5)\,dx = ?$

A) $(x^2 + 5x)^6 + c$ B) $6(x^2 + 5x)^5 + c$

C) $\frac{(x^2 + 5x)^7}{7} + c$ D) $\frac{x^2}{7} + c$

E) $\frac{x^7}{7} + 5x + c$

6. $\int \left(\frac{3x^2 + 6}{x^3 + 6x}\right) dx = ?$

A) $\ln|x^3 - 6x| + c$ B) $\ln|3x^2 + 6| + c$

C) $\ln|3x^2 - 6| + c$ D) $\ln|x^3 + 6x| + c$

E) $\ln|\sqrt{x^2 + 6}| + c$

7. $\int \frac{e^{\sqrt{x}}}{2\sqrt{x}}\,dx = ?$

A) $e^x + c$ B) $\sqrt{e^x} + c$ C) $e^{2x} + c$

D) $\ln|e^x| + c$ E) $e^{\sqrt{x}} + c$

8. $\int (\tan x + \tan^3 x)\,dx = ?$

A) $\tan x + c$ B) $\tan^3 x + c$ C) $\sec^3 x + c$

D) $\frac{\tan^2 x}{2} + c$ E) $\frac{\sin^2 x}{2} + c$

9. $\int x^{-1} \cdot \ln^3 x \, dx = ?$

A) $\frac{\ln^4 x}{4} + c$ B) $\ln|\sqrt{x}| + c$ C) $\frac{\ln^3 x}{3} + c$

D) $\frac{\ln x}{4} + c$ E) $x^3 \ln x + c$

10. $\int \frac{dx}{(2x+3)^3} = ?$

A) $-\frac{1}{4} \cdot (2x+3)^2 + c$ B) $-\frac{1}{4} \cdot (2x+3)^{-2} + c$

C) $\frac{1}{4} \cdot (2x+3)^2 + c$ D) $\frac{1}{4} \cdot (2x+3)^{-2} + c$

E) $-\frac{1}{4} \cdot (2x+3)^{-2} + c$

11. $\int \cos^3 x \, dx = ?$

A) $x - \frac{\sin^3 x}{3} + c$ B) $\frac{\sin^3 x}{3} + c$

C) $\sin x - \frac{\sin^3 x}{3} + c$ D) $\sin x + c$

E) $\frac{\sin^3 x}{3} + \frac{x^3}{3} + c$

12. $\int \frac{\cot x}{\ln(\sin x)} dx = ?$

A) $\ln|\sin x| + c$ B) $\ln|\cos x| + c$

C) $\ln|\ln|\cos x|| + c$ D) $\ln|\tan x| + c$

E) $\ln|\ln(\sin x)| + c$

13. $\int \text{arc}\tan(\cot x) \, dx = ?$

A) $-\text{arc}\cot x + c$ B) $-\text{arc}\sin x + c$

C) $-\frac{\text{arc}\tan^3(\cot x)}{3} + c$ D) $\frac{-\text{arc}\cot^3(\tan x)}{3} + c$

E) $-\frac{\text{arc}\tan^2(\cot x)}{2} + c$

14. $\int \frac{dx}{x + \ln x^x} = ?$

A) $\ln|\ln x| + c$ B) $\ln\left|\frac{1}{x}\right| + c$

C) $\ln|1 + \ln x| + c$ D) $\ln|x^x| + c$

E) $\ln|x| + x + c$

15. $2\int \sin 5x \cdot \cos 5x \, dx = ?$

A) $-\cos 10x + c$ B) $\cos 5x + c$

C) $-\sin 10x + c$ D) $\sin 10x + c$

E) $\frac{-\cos 10x}{10} + c$

16. $\int \frac{1 + \cos x}{\sin x} dx = ?$

A) $2\ln\left|\sin\frac{x}{2}\right| + c$ B) $2\ln\left|\cos\frac{x}{2}\right| + c$

C) $\ln\left|\sin\frac{x}{2}\right| + c$ D) $\ln\left|\cos\frac{x}{2}\right| + c$

E) $2\ln|\sin x| + c$

1-B 2-B 3-A 4-A 5-C 6-D 7-E 8-D 9-A 10-B 11-C 12-E 13-E 14-C 15-E 16-A

TEST 5

1. $\int f'(x) \cdot f''(x)\,dx = ?$

A) $f(x) + c$ B) $f'(x) + c$ C) $f''(x) + c$

D) $\frac{[f'(x)]^2}{2} + c$ E) $\frac{f^2(x)}{2} + c$

2. $\int g'(4x + 1)\,dx = ?$

A) $g(4x) + c$ B) $\frac{1}{4} \cdot g(4x + 1) + c$

C) $g'(4x) + c$ D) $\frac{1}{4} \cdot g'(4x + 1) + c$

E) $\frac{g^2(x)}{2} + c$

3. $\int \frac{1}{x^2 + 8x + 17}\,dx = ?$

A) $\tan(4x + 1) + c$ B) $\cot(4x + 1) + c$

C) $\arctan(4x + 1) + c$ D) $\operatorname{arc\,cot}(x + 4) + c$

E) $\arctan(x + 4) + c$

4. $A = \int \frac{\sqrt[5]{x+2} + \sqrt{x+2}}{\sqrt[3]{x+2}}\,dx$

$u = \sqrt[30]{x+2}$

$\Rightarrow$ **A = ?**

A) $30\int (u^{25} + u^{34})\,du$ B) $30\int u^{25}\,du$

C) $30\int \left(\frac{u^6 + u^{15}}{u^{10}}\right) du$ D) $30\int (u^4 + u^5)\,du$

E) $10\int (u^4 + u^5)\,du$

5. $B = \int \frac{2x + 1}{\sqrt[3]{x^2 + x + 5}}\,dx$

$u^3 = x^2 + x + 5$

$\Rightarrow$ **B = ?**

A) $\int 3u^3\,du$ B) $\int 3u^2\,du$ C) $\int 3u\,du$

D) $\int 3\,du$ E) $\int \frac{3}{u}\,du$

6. $A = \int \frac{1}{\cos^4 x}\,dx$

$u = \tan x$

$\Rightarrow$ **A = ?**

A) $\int \frac{1}{(1+u^2)^3}\,du$ B) $\int \frac{1}{1+u^2}\,du$ C) $\int (1 + u^4)\,du$

D) $\int \frac{du^2}{u}$ E) $\int (1 + u^2)\,du$

7. $B = \int \frac{e^{\sqrt{x}}}{\sqrt{x}}\,dx$

$\sqrt{x} = u$

$\Rightarrow$ **B = ?**

A) $\int e^{\sqrt{u}}\,du$ B) $2\int e^u\,du$ C) $2\int e^{\sqrt{u}}\,du$

D) $\int \sqrt{u}^e\,du$ E) $\int \frac{1}{\ln u}\,du$

8. $A = \int x^3 \cdot e^{x^4 + 2}\,dx$

$x^4 + 2 = u$

$\Rightarrow$ **A = ?**

A) $\frac{1}{4}\int e^u\,du$ B) $\int e^u\,du$ C) $\frac{1}{2}\int e^{2u}\,du$

D) $\int e^{2u}\,du$ E) $\int \frac{e^u}{\sqrt{u}}\,du$

9. $\int 5^{\sin^2 x} \cdot 5^{\cos^2 x}\, dx = ?$

A) sinx + c B) cosx + c C) x + c

D) $5^{\sin x}$ + c E) 5x + c

10. $\int \tan x \cdot d(\sin x) = ?$

A) sinx + c B) cosx + c C) – cosx + c

D) – sinx + c E) tanx + c

11. $0 < x < \frac{\pi}{4}$

$\Rightarrow \int \sqrt{1 - \sin 2x}\, dx = ?$

A) sinx – cosx + c B) cosx – sinx + c

C) – sinx – cosx + c D) sinx + cosx + c

E) tanx + cotx + c

12. $\int 5^{\log_5 x}\, dx + \int \frac{e^{\ln 3x}}{3x}\, dx = ?$

A) (x + 1) + c B) 2x + c C) $(x^2 + 1)$ + c

D) $\frac{x^2}{2} + x + c$ E) $\frac{x^2}{2} - x + c$

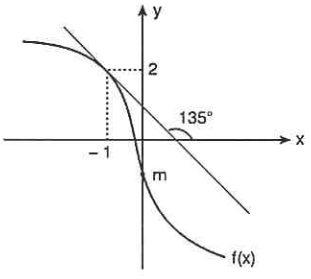
13. f(1) = 6

$x^2 + 3x = \int f'(x)\, dx$

$\Rightarrow$ **f(3) = ?**

A) 17 B) 18 C) 19 D) 20 E) 21

14.



$f''(x) = 6x$

$\Rightarrow$ **m = ?**

A) 2 B) 1 C) 0 D) – 2 E) – 1

15. $\int \left[\frac{x \cdot f'(x) - f(x)}{x^2}\right] dx = ?$

A) $\frac{x}{f(x)} + c$ B) $\frac{f(x)}{x} + c$ C) x f(x) + c

D) f'(x) + c E) f(x) + c

16. $\int (x - 1)(x + 1)(x^2 + 1)(x^4 + 1)\, dx = ?$

A) $\frac{x^9}{9} - x + c$ B) $x^9 + x + c$ C) $\frac{x^5}{5} - x + c$

D) $x^5 + x + c$ E) $(x^5 + 1)^2 + c$

1-D 2-B 3-E 4-A 5-C 6-E 7-B 8-A 9-E 10-C 11-D 12-D 13-D 14-E 15-B 16-A

TEST 6

1. $\int \frac{x+7}{x+6}\,dx = ?$

A) $x + \ln|x+6| + c$ B) $\ln|x+7| + c$

C) $\ln|x-7| + c$ D) $\ln|x+6| + c$

E) $x + \ln|x-6| + c$

2. $\int \frac{5x+7}{x+1}\,dx = ?$

A) $2\ln|x+1| + c$ B) $2\ln|x+1|\, x + c$

C) $5x + \ln|x^2+2x+1|$ D) $5x + \ln|x+1| + c$

E) $5x^2 + \ln|x^2| + c$

3. $\int \frac{2x^3+2x+1}{x^2+1}\,dx = ?$

A) $x^2 + \ln|x^2+1| + c$ B) $2x^2 + \ln|x^2+1| + c$

C) $x^2 + 2\ln|x^2+1| + c$ D) $x^2 + \text{arc tan}x + c$

E) $x^2 + \text{arc sin}x + c$

4. $\int \frac{3x^2+6x+1}{x+2}\,dx = ?$

A) $3x + \ln|x+2| + c$ B) $\frac{3x^2}{2}\ln|x+2| + c$

C) $\frac{2x^2}{3}\ln|x+2| + c$ D) $\frac{3x^2}{2} + \ln|x+2| + c$

E) $x^3 + \frac{3}{2}\ln|x+2| + c$

5. $\int \frac{x^2-y^2}{x-y}\,dx = ?$

A) $x + y + c$ B) $x^2 + y^2 + c$

C) $\frac{x^2}{2} + xy + c$ D) $\frac{x^2}{2} + \frac{y^2}{2} + c$

E) $\frac{y^2}{2} + xy + c$

6. $\int \frac{\sin^3x - 1}{\sin^2x + \sin x + 1}\,dx = ?$

A) $\cos x + x + c$ B) $\sin x + x + c$

C) $\ln|x| + \sin x + c$ D) $\ln|x| + \cos x + c$

E) $-x - \cos x + c$

7. $\int \frac{\cos 2x}{\cos x - \sin x}\,dx = ?$

A) $\sin x - \cos x + c$ B) $\sin x + \cos x + c$

C) $-\sin x - \cos x + c$ D) $\sin x + 2x + c$

E) $\cos x + x^2 + c$

8. $\int \frac{5}{x^2+x-6}\,dx = ?$

A) $5\ln\left|\frac{3x^2}{x+3}\right| + c$ B) $5\ln\left|\frac{x+3}{x-2}\right| + c$

C) $\frac{1}{5}\ln\left|\frac{x-2}{x+3}\right| + c$ D) $\ln\left|\frac{x-2}{x+3}\right| + c$

E) $\ln\left|\frac{x+3}{x-2}\right| + c$

9. $\int \frac{e^{4x}-1}{e^{2x}-1}\,dx = ?$

A) $e^{2x}+x+c$ B) $e^{2x}-x+c$ C) $2e^{2x}+x+c$

D) $2e^{2x}-x+c$ E) $\frac{e^{2x}}{2}+x+c$

10. $\int \frac{2x-2}{x^2+1}\,dx = ?$

A) $\arctan(x^2+1)+\ln|x^2+1|+c$

B) $\ln|x^2+1|+2\,\text{arc cot}x+c$

C) $x^2+\arctan x+c$

D) $x^2-\arctan x+c$

E) $\ln|x^2+1|+\arctan x+c$

11. $\int \frac{4x+3}{(x^2+1).(x^2+4x+4)}\,dx = ?$

A) $\arcsin x-\frac{1}{x+2}+c$ B) $\arcsin x+\frac{1}{x+2}+c$

C) $\arctan x+\ln|x+2|+c$ D) $\arctan x+\frac{1}{x+2}+c$

E) $\arctan x-\frac{1}{x+2}+c$

12. $\int \frac{x^3-1}{x^2+x+1}\,dx = ?$

A) $\frac{x^2}{2}-x+c$ B) $\frac{x^2}{2}+x+c$

C) x^2+x+c D) x^2-x+c

E) $\frac{x^2}{2}-2x+c$

13. $\int \frac{dx}{4x^2+4x+2} = ?$

A) $\ln|4x^2+4x+2|+c$ B) $-\frac{1}{2x+1}+c$

C) $\frac{1}{2}\arctan(2x+1)+c$ D) $\frac{1}{2}\arctan(2x+1)^2+c$

E) $\arcsin(2x+1)+c$

14. $\int x^2 . f(x)\,dx = x^4-3x^3+3x$

$\Rightarrow$ **f(x) = ?**

A) $4x^3-9x^2+3$ B) $4x^3+9x^2+3$

C) $4x-9-\frac{3}{x^2}$ D) $4x-9+\frac{3}{x^2}$

E) $4x-9$

15. $f(x) = x . \int (x+1)\,dx$

$f'(2) = 13$

$\Rightarrow$ **f(4) = ?**

A) 62 B) 60 C) 35 D) 34 E) 33

16. $\int d(\cos^4 x-\sin^4 x) = ?$

A) $\cos^2 x+c$ B) $\sin^2 x+c$ C) $\sin 2x+c$

D) $-\cos 2x+c$ E) $\cos 2x+c$

1-A 2-C 3-D 4-D 5-C 6-E 7-A 8-D 9-E 10-B 11-D 12-A 13-C 14-D 15-B 16-E

TEST 7

1. $\int \frac{f(x)}{x}\,dx = x^3 + 3x^2 - 2x + 1$

$\Rightarrow$ **f(2) = ?**

A) 48 B) 47 C) 46 D) 45 E) 44

2. $f(x) = \int d(e^x \cdot \ln x)$

$\Rightarrow$ **f'(1) = ?**

A) 0 B) 1 C) $\frac{1}{e}$ D) e E) e^3

3. $f(x) - x = \int (x^3 - 3x^2 + 3x - 1)\,dx$

$f(0) = 1$

$\Rightarrow$ **f(2) = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

4. $\int \frac{x-1}{x^2 + 8x + 15}\,dx = ?$

A) $\ln|x+5| + \ln|x+3| + c$

B) $2\ln|x+5| - \ln|x+3| + c$

C) $-2\ln|x+5| + 3\ln|x+3| + c$

D) $3\ln|x+5| - 2\ln|x+3| + c$

E) $4\ln|x-3| + \ln|x+1| + c$

5. $\int \frac{x - x^2}{(x^2+1)\,.\,(x+1)}\,dx = ?$

A) $\ln^2|x+1| + \ln|x^2+1| + c$

B) $\ln\left|\frac{x^2+1}{x+1}\right| + c$

C) $\ln|x+1| + c$

D) $\ln|x^2+1| + c$

E) $\ln\left|\frac{x+1}{x^2+1}\right| + c$

6. $\int \frac{x^3}{x+1}\,dx = ?$

A) $\frac{x^3}{3} - \frac{x^2}{2} + x + \ln|x+1| + c$

B) $\frac{x^2}{2} - x + \ln|x+1|$

C) $\ln|x+1| + c$

D) $x^3 - x^2 + x - \ln|x+1|$

E) $\frac{x^3}{3} - \frac{x^2}{2} + x - \ln|x+1| + c$

7. $\int \frac{dx}{x^2 - 16} = ?$

A) $8\,.\,\ln\left|\frac{x-4}{x+4}\right| + c$ B) $\ln\left|\frac{x+4}{x-4}\right| + c$

C) $\frac{x^2}{2} - \ln|x+4| + c$ D) $\frac{x^2}{2} + \ln|x+4| + c$

E) $\frac{1}{8}\,.\,\ln\left|\frac{x-4}{x+4}\right| + c$

8. $\int \frac{x^2\,dx}{x^6+4} = ?$

A) $\frac{1}{2}\arcsin\frac{x^2}{2}+c$ B) $\frac{1}{3}\arctan\frac{x^3}{2}+c$

C) $\frac{1}{6}\arctan\frac{x^3}{2}+c$ D) $\arctan\frac{x^2}{2}+c$

E) $\frac{1}{6}\arcsin\frac{x^2}{2}+c$

9. $\int e^{\cos^2 x}\,.\,\sin 2x\,dx = ?$

A) $e^{\cos^2 x}+c$ B) $-e^{\cos^2 x}+c$ C) $e^{-\cos^2 x}+c$

D) $\sin x+c$ E) $\cos x+c$

10. $\int \frac{e^{\arctan x}}{1+x^2}\,dx = ?$

A) $-e^{\tan x}+c$ B) $-e^{\cot x}+c$

C) $-e^{\arctan x}+c$ D) $e^{\arctan x}+c$

E) $e^{\operatorname{arc}\cot x}+c$

11. $\int \frac{d\left(\sqrt{f(x)}\right)}{\sqrt{f(x)}} = ?$

A) $\ln\sqrt{f(x)}+c$ B) $\sqrt{\ln f(x)}+c$

C) $\ln\left|\ln f(x)\right|+c$ D) $2\sqrt{f(x)}+c$

E) $x+c$

12. $\int \cot(\sin x)\,.\,\cos x\,dx = ?$

A) $\ln\left|\cos(\sin x)\right|+c$ B) $\ln\left|\sin(\cos x)\right|+c$

C) $\ln\left|\sin(\sin x)\right|+c$ D) $\ln\left|\tan(\cot x)\right|+c$

E) $1+\cot^2(\sin x)+c$

13. $\int \ln x\,dx = ?$

A) $x\,.\,\ln x+c$ B) $x+\ln x+c$

C) $x-\ln x+c$ D) $x\,.\,\ln x+x+c$

E) $x\,.\,\ln x-x+c$

14. $\int x^3\,.\,\cos x\,dx = ?$

A) $x^3.\sin x+3x^2\cos x-6x.\sin x-6\cos x+c$

B) $x^3.\sin x+3x^2\cos x-6x.\sin x+6\cos x+c$

C) $x^3.\sin x+3x^2\cos x+6x.\sin x+6\cos x+c$

D) $x^3.\sin x-3x^2\cos x-6x.\sin x+6\cos x+c$

E) $x^3.\sin x-3x^2\cos x+6x.\sin x-6\cos x+c$

15. $\int x^2\,.\,e^x\,dx = ?$

A) $e^x(x^2+2x+2)+c$ B) $e^x(x^2-2x+2)+c$

C) $e^x(x^2-2x+1)+c$ D) $e^x(x^2+2x+1)+c$

E) $e^x+x^2+2x+2+c$

1-E 2-D 3-C 4-D 5-B 6-E 7-E 8-C 9-B 10-D 11-A 12-C 13-E 14-A 15-B

TEST 8

1. $\int x \cdot \sin x \, dx = ?$

A) $-x \cdot \cos x + \sin x + c$ B) $x \cdot \cos x + \sin x + c$

C) $x \cdot \cos x - \sin x + c$ D) $-x \cdot \cos x - \sin x + c$

E) $\sin x + \cos x + c$

2. $\int x \cdot \cos x \, dx = ?$

A) $\sin x - x^2 + c$ B) $x \sin x - \cos x + c$

C) $x \sin x + \cos x + c$ D) $x \cos x + \sin x + c$

E) $x \cos x - \sin x + c$

3. $a \in R$

$\int_0^3 (x \cdot a)^2 \, dx = ?$

A) $9a^2$ B) $8a^2$ C) $7a^2$ D) $6a^2$ E) $5a^2$

4. $\int_0^{\frac{\pi}{2}} \frac{\cos x}{1 + \sin x} \, dx = ?$

A) $\ln 1$ B) $\ln(1, 5)$ C) $\ln 2$

D) $\ln(2, 5)$ E) $\ln 3$

5. $\frac{d}{dx}\left[\int_{2020}^{2021} (x - 2020) \, dx\right] = ?$

A) 2021 B) 2020 C) 1010 D) 1 E) 0

6. $\int_0^1 (4x - 3)^3 \, dx = ?$

A) -20 B) -5 C) $-\frac{5}{2}$ D) $\frac{41}{2}$ E) $\frac{41}{8}$

7. $\int_3^4 \frac{dx}{x^2 + x} = ?$

A) $\ln \frac{16}{15}$ B) $\ln \frac{15}{14}$ C) $\ln \frac{14}{13}$

D) $\ln \frac{4}{3}$ E) $\ln \frac{3}{4}$

8. $\int_{-\frac{\pi}{10}}^{\frac{\pi}{10}} \sin 5x \cdot \cos 5x \, dx = ?$

A) $-\frac{1}{2}$ B) -1 C) 0 D) 1 E) $\frac{1}{2}$

9. $m \cdot \int_1^e \frac{\ln x + x^2}{x}\,dx = e^2$

$\Rightarrow$ **m = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

10. $\int_5^{10} \left(\frac{1}{\sqrt{x}-2} - \frac{1}{\sqrt{x}+2}\right) dx = ?$

A) 8 . ln6 B) 7 . ln6 C) 6 . ln6

D) 5 . ln6 E) 4 . ln6

11. $\int_{27^2}^{73^2} \sec x \cdot d(\sin x) = ?$

A) 0 B) 2020 C) 2600

D) 3600 E) 4600

12. $f(x) = \begin{cases} -1, & x \geq 2 \\ 2x, & x < 2 \end{cases}$

$\Rightarrow \int_{-1}^{4} f(x)\,dx = ?$

A) 5 B) 4 C) 3 D) 2 E) 1

13. $\int_3^7 |x-4|\,dx = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

14. $\int_0^{\frac{\pi}{3}} \left|\frac{\sin x}{\cos x} - \frac{1}{\sqrt{3}}\right| dx = ?$

A) $\ln\frac{3}{2}$ B) $\ln\frac{2}{3}$ C) 0

D) $\ln\frac{\sqrt{2}}{3}$ E) $\ln\frac{\sqrt{3}}{2}$

15. $\int_3^6 f(2x)\,dx = 10$

$\Rightarrow \int_{12}^{6} f(x)\,dx = ?$

A) – 5 B) – 10 C) – 20 D) 10 E) 20

16. $A = \int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \tan\theta \cdot \ln(\tan\theta)\,d\theta$

$\theta = \arctan u$

$\Rightarrow$ **A = ?**

A) $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} u \ln u\,du$ B) $\int_1^{\sqrt{3}} \frac{\ln u}{1+u^2}\,du$

C) $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \frac{u \ln u}{1+u^2}\,du$ D) $\int_1^{\sqrt{3}} \frac{u \cdot \ln u}{1+u^2}\,du$

E) $\int_1^{\sqrt{3}} \ln u\,du$

1-A 2-C 3-A 4-C 5-E 6-B 7-A 8-C 9-D 10-E 11-E 12-E 13-B 14-A 15-C 16-D

TEST 9

1. $\int \text{arc cosx dx} = ?$

A) $x \cdot \text{arc cosx} + \sqrt{1 - x^2} + c$

B) $x \cdot \text{arc cosx} - \sqrt{1 - x^2} + c$

C) $x \cdot \text{arc cosx} + \sqrt{1 + x^2} + c$

D) $x \cdot \text{arc cosx} - \sqrt{1 + x^2} + c$

E) $\ln|x| + x^2 + c$

2. $\int \sin^2 x\, dx = ?$

A) $\frac{x}{2} + \frac{\sin 2x}{4} + c$ B) $\frac{x}{2} + \frac{\sin 2x}{2} + c$

C) $\frac{x}{2} - \frac{\sin 2x}{4} + c$ D) $\frac{x}{2} - \frac{\sin 2x}{2} + c$

E) $x - \sin 2x + c$

3. $\int \cos^2 x\, dx = ?$

A) $\frac{1}{2}x + \frac{1}{4}\sin 2x + c$ B) $\frac{1}{2}x - \frac{1}{4}\sin 2x + c$

C) $\frac{1}{2}x + \frac{1}{4}\cos 2x + c$ D) $\frac{1}{2}x - \frac{1}{4}\cos 2x + c$

E) $x + \cos 2x + c$

4. $f(x) = \int_x^{x^2} (x^2 - 1)\, dx$

$\Rightarrow [f(1)]' = ?$

A) $x^4 - x$ B) 14 C) 2 D) 1 E) 0

5. $\int \frac{4x^2 - x + 1}{x^3 + 1} dx = ?$

A) $2\ln|x + 1| + \ln|x^2 - x + 1| + c$

B) $2\ln|x + 1| - \ln|x^2 - x + 1| + c$

C) $2\ln|x - 1| + \ln|x^2 + x + 1| + c$

D) $2\ln|x - 1| - \ln|x^2 + x + 1| + c$

E) $\ln|x - 1| + \ln|x^2 + x + 1| + c$

6. $\int \frac{dx}{x^2 + 4} = ?$

A) $\arctan x + c$ B) $2\arctan\frac{x}{2} + c$

C) $\arctan\frac{x}{2} + c$ D) $\frac{1}{2}\arctan\frac{x}{2} + c$

E) $\frac{1}{2}\arctan x + c$

7. $\int \frac{dx}{x \cdot (x + 1)^2} = ?$

A) $\frac{1}{x + 1} - \ln|x - 1| + \ln|x| + c$

B) $\frac{1}{x + 1} + \ln|x - 1| + \ln|x| + c$

C) $\frac{1}{x + 1} - \ln|x + 1| + \ln|x| + c$

D) $\frac{1}{x + 1} + \ln|x + 1| + \ln|x| + c$

E) $\frac{1}{x + 1} - \ln|x + 1| - \ln|x| + c$

8. $\int_a^b (4x + 1)\, dx = 40$

$a + b = 2$

$\Rightarrow a^2 - b^2 = ?$

A) -20 B) -16 C) -12 D) 16 E) 20

9. $f(x) = \int_2^x \frac{t^3 - 1}{t + 1}\,dt$

$\Rightarrow$ **f'(x) dx = ?**

A) $\frac{x^3 + 1}{x - 1}$ B) $\frac{x^3 - 1}{x + 1} - \frac{7}{3}$ C) $\frac{x^3 - 1}{x + 1}$

D) 0 E) $\frac{7}{3}$

10. $\frac{d}{dy}\int_0^{2y} \sqrt{x^2 + 4}\,dx = ?$

A) $4\sqrt{y^2 + 1}$ B) $4\sqrt{x^2 + 1}$ C) 0

D) $2\sqrt{y^2 + 1}$ E) $2\sqrt{x^2 + 1}$

11. $F(x) = \int_{\sqrt{x}}^6 \frac{t^2 + 2}{t^4 + t^2}\,dt$

$\Rightarrow \left.\frac{dF(x)}{dx}\right|_{x=1} = ?$

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{3}{4}$ D) $-\frac{3}{4}$ E) $-\frac{1}{4}$

12. $\int \sin 5x \cdot \cos 3x\,dx = ?$

A) $16\cos 8x - 4\cos 2x + c$

B) $16\cos 8x + 4\cos 2x + c$

C) $\frac{1}{16}\cos 8x - \frac{1}{4}\cos 2x + c$

D) $\frac{1}{16}\cos 8x + \frac{1}{4}\cos 2x + c$

E) $-\frac{1}{16}\cos 8x - \frac{1}{4}\cos 2x + c$

13. $\int_0^{\frac{\pi}{2}} \frac{dx}{1 + \sin x} = ?$

A) – 1 B) 0 C) 1 D) 2 E) 3

14. $\lim_{x \to 1} \frac{\int_e^{e^x} \ln y\,dy}{x - 1} = ?$

A) e^2 B) e C) – 1 D) 1 E) 0

15. $A = \sin^3 x$

$B = \cos^3 x$

$\Rightarrow \int A \cdot B\,dx = ?$

A) $\frac{\sin^3 x}{3} - \frac{\sin^5 x}{5} + c$ B) $\frac{\sin^3 x}{3} + \frac{\sin^5 x}{5} + c$

C) $\frac{\sin^4 x}{4} + \frac{\sin^6 x}{6} + c$ D) $\frac{\sin^4 x}{4} - \frac{\sin^6 x}{6} + c$

E) $\frac{\sin^4 x}{4} + \frac{\sin^5 x}{5} + c$

16. $\int x^3 \ln x\,dx = ?$

A) $\frac{x^4}{4}\ln x - \frac{x^4}{16} + c$ B) $\frac{x^4}{4}\ln x + \frac{x^4}{16} + c$

C) $\frac{x^2}{2}\ln x + \frac{x^4}{4} + c$ D) $\frac{x^2}{2}\ln x - \frac{x^4}{4} + c$

E) $\frac{x^4}{4}(\ln x + 1) + c$

1-B 2-C 3-A 4-E 5-A 6-D 7-C 8-B 9-C 10-A 11-D 12-E 13-C 14-B 15-D 16-A

TEST 10

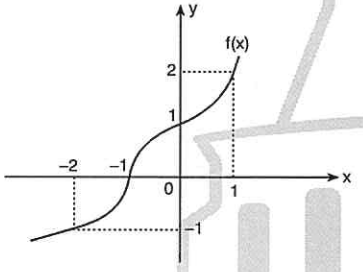
1. $\int_{-1}^{2} [\![x+3]\!]\,dx = ?$

A) 10 B) 9 C) 8 D) 7 E) 6

2. $\int_{0}^{6} x\left[\!\left[\frac{x}{2}\right]\!\right] dx = ?$

A) 26 B) 25 C) 24 D) 23 E) 22

3.



$\Rightarrow \int_{-2}^{1} [\![f(x)]\!]\,dx = ?$

A) 10 B) 5 C) 4 D) 2 E) 0

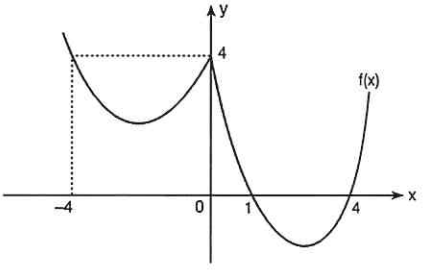
4. $\int_{-2}^{5} \text{sgn}(x-1)\,dx = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

5. $\int_{2}^{7} x\,\text{sgn}(x-3)\,dx = ?$

A) 13 B) 17 C) $\frac{17}{2}$ D) $\frac{35}{2}$ E) 35

6.



$\Rightarrow \int_{-4}^{4} \text{sgn}\big(f(x)\big)\,dx = ?$

A) 0 B) 1 C) 2 D) 3 E) 4

7. $\int \frac{\cot(\ln x)}{x}\,dx = ?$

A) $\ln|\cos x| + c$ B) $\ln|\cos(\ln x)| + c$

C) $\cot x + \ln x + c$ D) $\ln|\sin(\ln x)| + c$

E) $\ln|\sin x| + c$

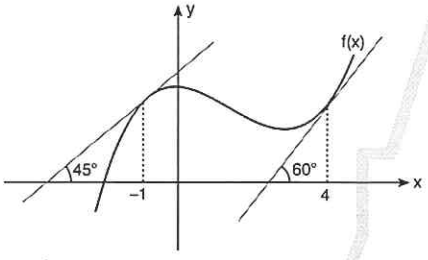
8. $\int_{-3}^{2} |x| \,.\, \text{sgn}(x)\,dx = ?$

A) $-\frac{5}{2}$ B) -2 C) -1 D) 1 E) 2

9. $\int_{1}^{5} x^{\text{sgn}(x+4)}\,dx = ?$

A) 18 B) 16 C) 14 D) 12 E) 10

10.



$\Rightarrow \int_{-1}^{4} f''(x) \cdot f'(x)\,dx = ?$

A) $\frac{1}{2}$ B) 1 C) 2 D) 3 E) 4

11. $\int_{2}^{4} [\text{sgn}(x-3)]^{[\![x+1]\!]}\,dx = ?$

A) 4 B) 3 C) 2 D) 1 E) 0

12. $f(x) = \frac{4}{x+1}$

$\Rightarrow \int_{-1}^{2} d(f^{-1}(x)) = ?$

A) 9 B) 8 C) 7 D) 6 E) 5

13. $A = \int_{0}^{3} \sqrt{9-x^2}\,dx$

$x = 3\sin t$

$\Rightarrow$ **A = ?**

A) $3\int_{0}^{3} \cos^2 t\,dt$ B) $9\int_{0}^{3} \cos^2 t\,dt$

C) $\int_{0}^{\frac{\pi}{2}} \cos^2 t\,dt$ D) $9\int_{0}^{\frac{\pi}{2}} \cos^2 t\,dt$

E) $9\int_{0}^{\frac{\pi}{2}} \sin^2 t\,dt$

14. $\int_{-2}^{0} \left[\sqrt{4-x^2} - (x+2)\right] dx = ?$

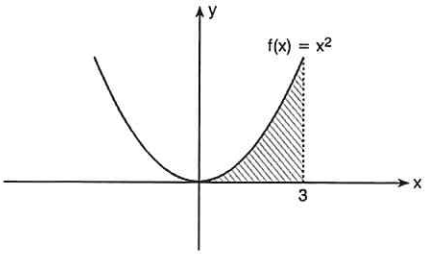
A) $\pi - 2$ B) $\pi^2 + \sqrt{2}$ C) $\pi + 2$

D) $\pi - 4$ E) $\pi + 4$

1-B 2-A 3-E 4-B 5-D 6-C 7-D 8-A 9-D 10-B 11-E 12-D 13-D 14-A

TEST 11

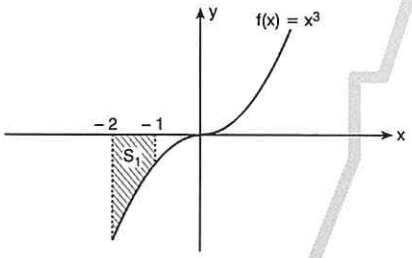
1.



⇒ **Taralı alan = ?**
Shaded Area?

A) 4 B) 5 C) 7 D) 8 E) 9

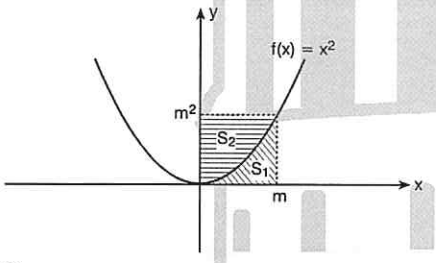
2.



⇒ $S_1 = ?$

A) $\frac{15}{4}$ B) 3 C) 2 D) 1 E) $-\frac{15}{4}$

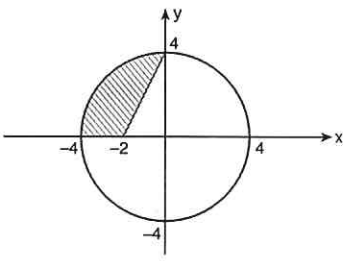
3.



⇒ $\frac{S_2}{S_1} = ?$

A) $\frac{1}{2}$ B) 1 C) 2 D) 3 E) 4

4.



⇒ **Taralı alan = ?**
Shaded Area?

A) $\int_{-4}^{-2} \left[\sqrt{4 - x^2} - 2x + 4\right] dx$

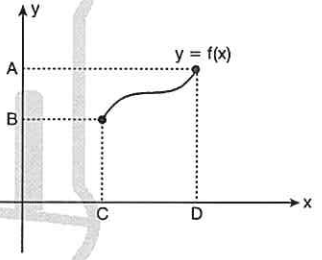
B) $\int_{-2}^{-4} \left[\sqrt{4 - x^2} - 2x + 4\right] dx$

C) $\int_{-4}^{-2} \left[\sqrt{4 - y^2} - 2y - 4\right] dy$

D) $\int_{0}^{4} \left[\sqrt{16 - y^2} - \frac{y - 4}{2}\right] dy$

E) $\int_{0}^{4} \left[\sqrt{16 - y^2} + \frac{y - 4}{2}\right] dy$

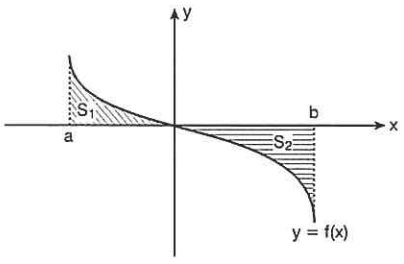
5.



⇒ $\int_{A}^{B} f^{-1}(x)\,dx + \int_{C}^{D} f(x)\,dx = ?$

A) A . B + C . D B) AD − BC C) B . D
D) A . C − BD E) A . B + C . D

6.



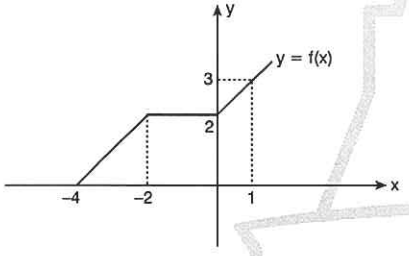
$\int_a^b f(x)\,dx = -8$

$S_1 = 10$

⇒ **S_2 = ?**

A) 2 B) 5 C) 8 D) 18 E) 20

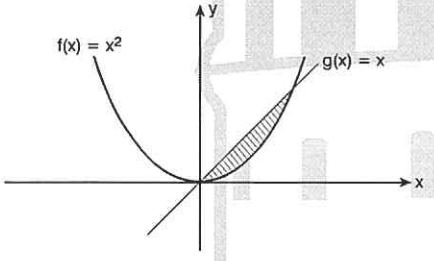
7.



⇒ $\int_{-4}^{1} f(x)\,dx = ?$

A) 9 B) 8,5 C) 8 D) 7,5 E) 7

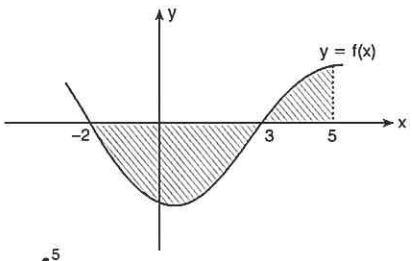
8.



⇒ **Taralı alan = ?**
Shaded Area?

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{2}$ D) 1 E) 2

9.



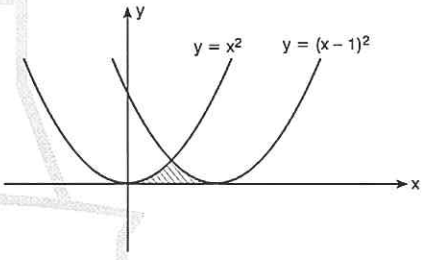
$\int_{-2}^{5} f(x)\,dx = -10$

$\int_{-2}^{5} |f(x)|\,dx = 40$

⇒ $\int_{3}^{-2} f(x)\,dx = ?$

A) 35 B) 25 C) – 15 D) – 25 E) – 35

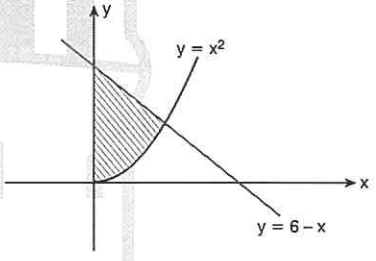
10.



⇒ **Taralı alan = ?**
Shaded Area?

A) $\frac{1}{24}$ B) $\frac{1}{18}$ C) $\frac{1}{12}$ D) $\frac{1}{6}$ E) $\frac{1}{2}$

11.



⇒ **Taralı alan = ?**
Shaded Area?

A) $\frac{11}{3}$ B) $\frac{13}{3}$ C) $\frac{17}{3}$ D) $\frac{22}{3}$ E) $\frac{25}{3}$

1-E 2-A 3-C 4-E 5-B 6-D 7-B 8-A 9-B 10-C 11-D

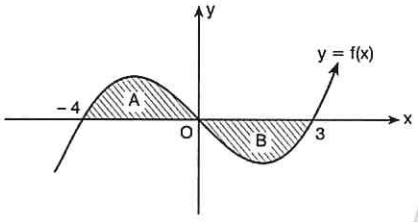
TEST 12

1. $\int_0^3 (\sqrt{9 - x^2} + 2x)\,dx = ?$

A) $\frac{\pi}{4} + 2$ B) $3\left(\frac{\pi}{4} + 1\right)$ C) $9\left(\frac{\pi}{4} + 1\right)$

D) $\frac{\pi}{4} - 1$ E) $\frac{\pi}{4} + 1$

2.



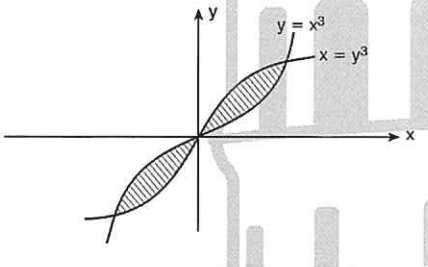
$\int_{-4}^{3} f(x)\,dx = 5$

$A = 2B$

$\Rightarrow \int_0^3 f(x)\,dx = ?$

A) – 10 B) – 5 C) – 3 D) 5 E) 10

3.



$\Rightarrow$ **Taralı alan = ?**
Shaded Area?

A) $\frac{13}{6}$ B) $\frac{5}{6}$ C) $\frac{5}{4}$ D) 1 E) $\frac{1}{2}$

4. $f(x) = \int_0^2 \frac{d^2}{dx^2}(4x^3 - 2x^2 + 5)\,dx = ?$

A) 40 B) 41 C) 42 D) 43 E) 44

5. $\int_1^3 \frac{\arctan\sqrt{x}}{\sqrt{x} + x\sqrt{x}}\,dx = ?$

A) $\frac{\pi^2}{12}$ B) $\frac{\pi^2}{144}$ C) $\frac{7\pi^2}{144}$

D) $\frac{7\pi^2}{12}$ E) $\frac{12\pi^2}{7}$

6. $a < 0 < b$

$\int_a^b [2x - \text{sgn}(x)]\,dx = 20$

$a + b = 4$

$\Rightarrow$ **a . b = ?**

A) – 6 B) – 5 C) 0 D) 5 E) 6

7. $\Rightarrow \int_0^1 [\![e^{x^2}]\!]\,dx = ?$

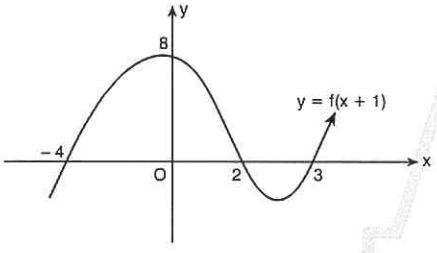
A) $1 - \sqrt{\ln 2}$ B) $2 - \sqrt{\ln 2}$ C) $1 + \sqrt{\ln 2}$

D) $2 + \sqrt{\ln 2}$ E) e^2

8. $\dfrac{\int_1^5 (x+5)^4\,dx}{\int_3^7 (x+3)^4\,dx} = ?$

A) $\frac{1}{2}$ B) 2 C) 1 D) $\frac{1}{4}$ E) 4

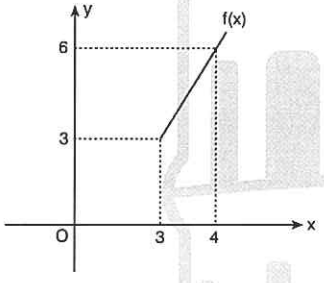
9.



$\Rightarrow \int_1^3 [3 - f'(x)]\,dx = ?$

A) 18 B) 16 C) 15 D) 14 E) 13

10.



$\Rightarrow \int_3^4 \dfrac{f'(x)}{f(x)}\,dx = ?$

A) e B) $\ln\frac{4}{3}$ C) ln2 D) 1 E) 0

11. $\int_1^e \left(\dfrac{\frac{e^x}{x} - e^x \ln x}{e^{2x}}\right) dx = ?$

A) e^{-e} B) $-e^e$ C) e^e D) e^2 E) e^{-2}

12. $\int_{-1}^{1} [x - f(x)]\,dx = 6$

$\Rightarrow \int_1^{-1} f(x)\,dx = ?$

A) 4 B) 5 C) 6 D) 7 E) 8

13. $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} x^2 \cdot \tan x\,dx = ?$

A) $\frac{\pi}{2}$ B) 2 C) e^2 D) 1 E) 0

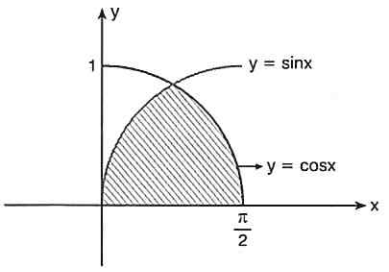
14. $\int_{-3}^{3} x^2(1 + \sin x)\,dx = ?$

A) 27 B) 18 C) 0 D) – 1 E) – 27

1-C 2-B 3-D 4-A 5-C 6-B 7-B 8-C 9-D 10-C 11-A 12-C 13-E 14-B

TEST 13

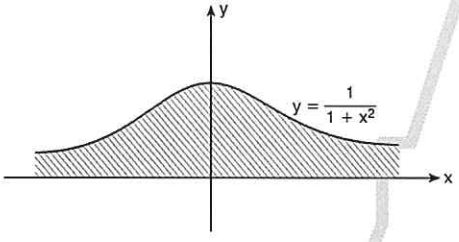
1.



⇒ **Taralı alan = ?**
Shaded Area?

A) $2 - \sqrt{2}$ B) $2 + \sqrt{2}$ C) $2\sqrt{2}$ D) $\sqrt{2}$ E) 4

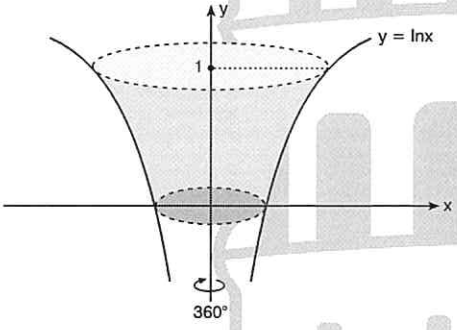
2.



⇒ **Taralı alan = ?**
Shaded Area?

A) $\frac{\pi}{4}$ B) $\frac{\pi}{2}$ C) π D) 2π E) 4π

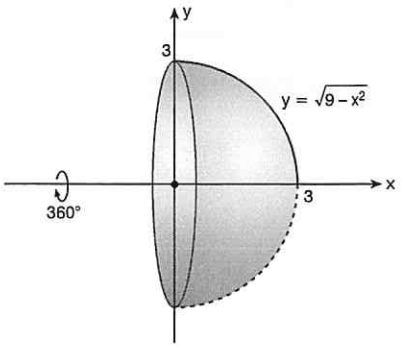
3.



Şekildeki dönel cismin hacmi kaç br³ tür?
What is the volume of the solid of ravolution in the figure in terms of br³?

A) $\pi(e^2 - 1)$ B) $\pi(e^2 + 1)$ C) $\frac{\pi}{2}(e^2 + 1)$
D) $\frac{\pi}{2}(e^2 - 1)$ E) $e^3 - \pi^3$

4.



Şekildeki dönel cismin hacmi kaç br³ tür?
What is the volume of the solid of ravolution in the figure in terms of br³?

A) 4π B) 9π C) 12π D) 18π E) 20π

5. $\int_{e^{-1}}^{e} \frac{m \cdot dx}{x} = \int_{2}^{10} dy$

⇒ **m = ?**

A) 12 B) 10 C) 8 D) 6 E) 4

6. $\int_{a}^{b} (x + 1)\,dx = 4$

$\int_{a}^{b} (2x + 3)\,dx = 18$

⇒ **b − a = ?**

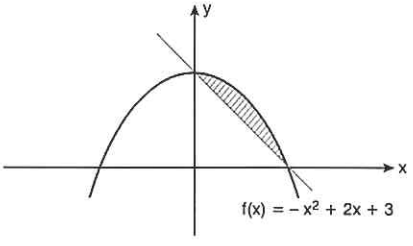
A) 18 B) 14 C) 10 D) − 10 E) − 14

7. $f(x) = x^2 + 5$

$\Rightarrow \int_{-1}^{3} [f'(x) + f''(x)]\,dx = ?$

A) 16 B) 12 C) 8 D) 4 E) 0

8.



$\Rightarrow$ **Taralı alan = ?**
Shaded Area?

A) 9 B) $\frac{9}{2}$ C) 4 D) 3 E) $\frac{3}{2}$

9. $f(x) = u$

$g(x) = v$

$\Rightarrow \int u \,.\, dv = ?$

A) $u \,.\, v - \int v \,.\, dv$ B) $u \,.\, v + \int v \,.\, dv$

C) $u \,.\, v + \int v^2 \,.\, du$ D) $u \,.\, v - \int v \,.\, du$

E) $\int u \,.\, du - \int v \,.\, dv$

10. $f''(x) = 6x - 2$

$f'(0) = 4$

$f(0) = 1$

$\Rightarrow$ **f(1) = ?**

A) 4 B) 5 C) 7 D) 9 E) 11

11. $f(x) = \begin{cases} 3 - x, & x < 2 \\ 2x - 3, & x \geq 2 \end{cases}$

$\Rightarrow \int_{1}^{3} f(x + 1)\,dx = ?$

A) 6 B) 5 C) 4 D) 3 E) 2

12. $\int_{0}^{3} f(x)\,dx = 2a$

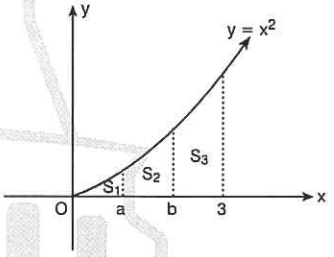
$\int_{0}^{3} x\,f'(x)\,dx = a$

$f(3) = 1$

$\Rightarrow$ **a = ?**

A) 5 B) 4 C) 3 D) 2 E) 1

13.



$S_1 = S_2 = S_3$

$\Rightarrow$ **$a^3 + b^3$ = ?**

A) 81 B) 54 C) 27 D) 18 E) 9

14. $f'(x) > 0$

$f(0) = 2$

$f(1) = 3$

$f(2) = 4$

$\int_{0}^{2} f(x)\,dx = A$

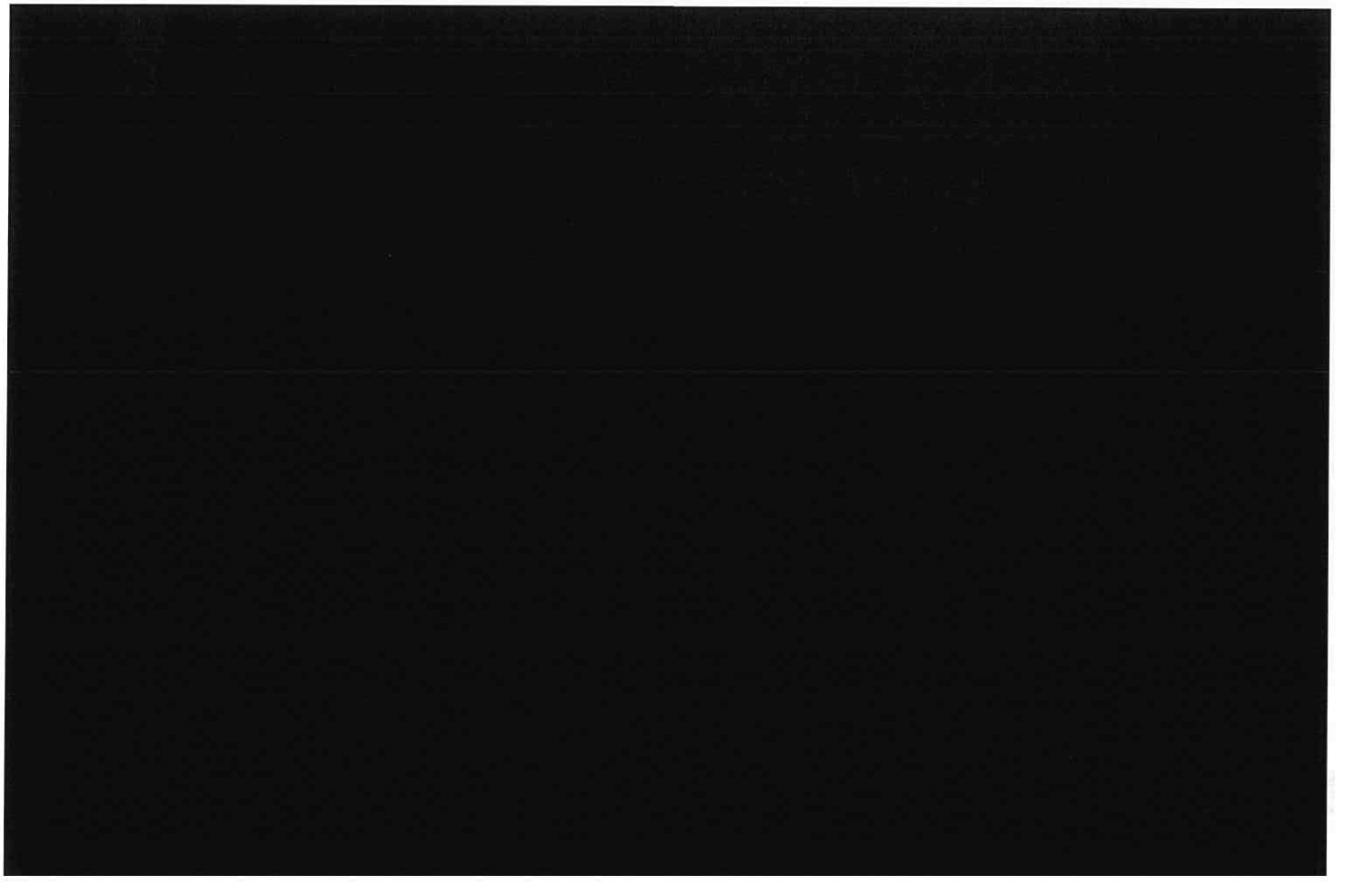
A aşağıdakilerden hangisi olabilir?
Which one of the following can be A?

A) $\frac{9}{2}$ B) $\frac{47}{10}$ C) $\frac{58}{10}$ D) $\frac{73}{10}$ E) 9

1-A 2-C 3-D 4-D 5-E 6-C 7-A 8-B 9-D 10-B 11-A 12-E 13-C 14-C

ÜNİTE 15

Unit 15



1. **6 farklı pantolonu ve 8 farklı gömleği olan bir kişi, 1 pantolon veya 1 gömleği kaç farklı şekilde seçebilir?**

A person has 6 different trousers and 8 different shirts in how many ways can he choose 1 trouser or 1 shirt?

A) 14 B) 18 C) 28 D) 30 E) 48

2. **6 farklı pantolonu ve 8 farklı gömleği olan bir kişi, 1 pantolon ve 1 gömleği kaç farklı şekilde seçebilir?**

A person has 6 different trousers and 8 different shirts in how many ways can he choose 1 trouser and 1 shirt?

A) 14 B) 18 C) 28 D) 30 E) 48

3. **10 atletin katıldığı bir final koşusunda altın, gümüş ve bronz madalyaları için ilk üç sıra kaç farklı şekilde belirlenebilir?**

10 athletes enter a final contest offers gold, silver and bronze metals respectively. In how many different ways can be come in first, second and third?

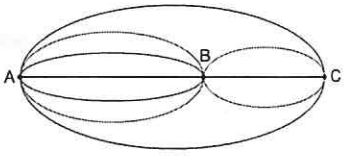
A) 150 B) 160 C) 200 D) 360 E) 720

4. **$\{0, 1, 2, 3, 4, 5\}$ kümesinin elemanları ile üç basamaklı kaç farklı sayı yazılabilir?**

How many different 3 digit numbers can be written by using the elements of set $\{0, 1, 2, 3, 4, 5\}$

A) 100 B) 120 C) 140 D) 180 E) 200

5.



A dan C ye kaç farklı biçimde gidilebilir?

In how many ways can you go from A to C?

A) 13 B) 14 C) 15 D) 17 E) 21

6. M kentinden N kentine 4 farklı yol ve N kentinden K kentine 6 yol vardır.

Buna göre, M kentinden K kentine gidilen yolları dönüşte kullanmamak şartıyla kaç farklı yoldan gidip gelinebilir?

There are 4 different roads from city M to city N and there are 6 different roads from city N to city K.

According to tihs in how many different ways can be gone from city M to city K providing that the some roads are not be used in return?

A) 180 B) 360 C) 720 D) 800 E) 1440

7. **$\{2, 3, 4, 5, 6\}$ kümesinin elemanları kullanılarak üç basamaklı kaç farklı tek doğal sayı yazılabilir?**

How many different 3 digit numbers can be written by using the elements of set $\{2, 3, 4, 5, 6\}$ providing that the numbers are odd natural numbers?

A) 15 B) 25 C) 50 D) 75 E) 100

8. **$\{1, 2, 3, 4, 5\}$ kümesinin elemanlarını kullanarak dört basamaklı rakamları farklı kaç tek doğal sayı yazılabilir?**

How many different 4 digit numbers can be written by using the elements of set $\{1, 2, 3, 4, 5\}$ providing that the numbers are odd natural numbers and different from each other?

A) 72 B) 80 C) 96 D) 144 E) 250

9. **$\{1, 2, 3, 4, 5, 6\}$ kümesinin elemanlarını kullanarak rakamları farklı üç basamaklı 400 den küçük kaç doğal sayı yazılabilir?**

How many different 3 digit numbers can be written by using the elements of set $\{1, 2, 3, 4, 5, 6\}$ providing that the numbers is smaller than 400?

A) 20 B) 30 C) 50 D) 60 E) 70

10. **$\{0, 3, 4, 5, 6, 7\}$ kümesinin elemanlarını kullanarak üç basamaklı rakamları farklı kaç çift doğal sayı yazılabilir?**

How many different 3 digit numbers can be written by using the elements of set $\{0, 3, 4, 5, 6, 7\}$ providing that the numbers are even natural numbers and different from each other?

A) 52 B) 32 C) 20 D) 10 E) 8

11. **4 kız ve 6 erkek düz bir sıraya kaç farklı biçimde oturabilir?**

In how many different ways can 4 girls and 6 boys sit an a flat bench?

A) 10 B) 24 C) 4! D) 6! E) 10!

12. **5 kız ve 4 erkek düz bir sıraya, erkekler yan yana olmak şartıyla kaç farklı biçimde oturabilir?**

In how many different ways can 5 girls and 4 boys sit an a flat bench in such a way that boys will sit side by side?

A) 5! . 4! B) 9! C) 5! . 5!
D) 6! . 4! E) 6! . 3!

13. $P(n, 3) \cdot (n - 3)! = 380 \cdot 18!$

$\Rightarrow$ **n = ?**

A) 20 B) 19 C) 18 D) 17 E) 16

14. $\dfrac{9! + 8!}{8! - 7!} = ?$

A) $\dfrac{7}{80}$ B) $\dfrac{8!}{7!}$ C) $\dfrac{80}{7}$ D) $\dfrac{81}{7}$ E) $\dfrac{87}{7}$

1-A 2-E 3-E 4-D 5-D 6-B 7-C 8-A 9-D 10-A 11-E 12-D 13-A 14-C

1. **8 öğretmen yuvarlak bir masa etrafında kaç farklı biçimde oturabilir?**

In how many different ways can 8 teachers sit around a round table?

A) 5! B) 6! C) 7! D) 8! E) 6! . 2!

2. **3 doktor, 4 mühendis, 2 öğretmen yuvarlak bir masa etrafında aynı meslekten olanlar yan yana olmak şartıyla kaç değişik şekilde oturabilir?**

In how many different ways can 3 doctors, 4 engineers, 2 teachers sit around tabel in such a way that people from the same proffesion will sit side by side?

A) 4! . 3! . 3! . 2! B) 3! . 4! . 2! . 2! C) 10!

D) 4! . 2! E) 3! . 4! . 3!

3. **3 farklı matematik, 2 farklı geometri, 4 farklı fizik kitabı bir rafa aynı ders kitapları yan yana gelmek şartıyla kaç farklı biçimde dizilebilir?**

In how many different ways can 3 different maths books, 2 different geometry books, 4 different physics books be aligned on a shelf in such a way that same genre of books will be side by side?

A) 9! B) 2! . 3! . 4! . 2! C) 3! . 3! . 2! . 4!

D) 6! . 5! E) 5! . 4!

4. **6 farklı anahtarın tamamı bir halkaya kaç değişik biçimde takılabilir?**

In how many different ways can all the 6 different keys be put around the key chain?

A) 60 B) 100 C) 120 D) 360 E) 720

5. **3 farklı matematik, 4 farklı geometri, 5 farklı kimya kitabı bir rafa kaç farklı biçimde dizilebilir?**

In how many different ways can 3 different maths books, 4 different geometry books, 5 different chemistry books be aligned side by side on a shelf?

A) 12! B) 3! . 5! . 4! C) 2! . 5!

D) 2! . 3! . 5! . 4! E) 11!

6. **3 öğrenci yan yana duran 7 sıraya kaç farklı biçimde oturabilir?**

In how many different ways can 3 students sit on a 7 different bench which stay side by side?

A) 7! B) 3! . 7! C) 120 D) 180 E) 210

7. **P(5, 2) + P(4, 3) = ?**

A) 44 B) 40 C) 38 D) 24 E) 14

8. $P(7, r) = 70 \cdot r$

$\Rightarrow$ **r = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

9. **8 avcının katıldığı bir hedefi vurma yarışmasında sonuç kaç farklı şekilde olabilir?**

8 hunters participated in a shooting contest. How many different results may appear?

A) 32 B) 64 C) 128 D) 256 E) 512

10. **2 farklı çikolata her çocuğa en fazla bir çikolata vermek koşuluyla n çocuğa kaç farklı biçimde verilebilir?**

In how many different ways can 2 bars of chocolate be distributed to n children in such a way that each child will take one chocolate at most?

A) 2 B) n C) n! D) $n^2 + n$ E) $n^2 - n$

11. **5 öğrencinin katıldığı bir matematik sınavı başarı yönünden kaç farklı şekilde sonuçlanabilir?**

In how many different ways the results may appear in a math test that is applied to 5 students?

A) 5! B) 60 C) 48 D) 32 E) 12

12. **5 erkek ve 5 kız düz bir sıraya, herhangi iki kız yan yana gelmemek koşuluyla kaç farklı biçimde oturabilir?**

In how many different ways can 5 boys and 5 girls sit on a flat bench in such a way that girls will not sit side by side?

A) 10! B) 5! . 6! C) 4! . 5!

D) 5! . 5! E) 2! . 5! . 5!

13. **"GALATA" kelimesindeki harfler kullanılarak altı harfli anlamlı veya anlamsız kaç farklı kelime yazılabilir?**

In how many different ways can words writh six letters be arranged using the letter of the word "GALATA" it doesn't matter if they are meaning full or meaningless?

A) 5! B) 60 C) 40 D) 32 E) 6!

14. **11222333 sayısının rakamları kullanılarak sekiz basamaklı kaç farklı sayı yazılabilir?**

How many 8 digit numbers can be written by using the numbers of 11222333?

A) $\frac{8!}{2! \cdot 3! \cdot 3!}$ B) 8! . 3! C) $\frac{8!}{2!}$

D) $\frac{8!}{3!}$ E) 8!

1-C 2-B 3-C 4-A 5-A 6-E 7-A 8-C 9-D 10-E 11-D 12-B 13-A 14-A

1. **10022211 sayısının rakamları kullanılarak sekiz basamaklı kaç farklı sayı yazılabilir?**

How many 8 digit numbers can be written by using the numbers of 10022211?

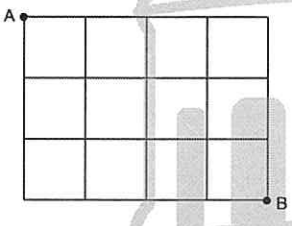
A) 520 B) 420 C) 210 D) 200 E) 120

2. **5 kişi belli iki kişinin yan yana oturmaması koşulu ile bir sıraya kaç değişik şekilde oturabilir?**

If 2 cortain persons can not be seated adjacent in how many ways can 5 persons be seated on a bench?

A) 5! B) 3! . 2! C) 5! – 3! . 2! D) 5! – 4! . 2! E) 4! . 2!

3.

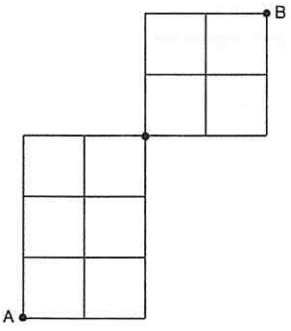


A noktasından başlayarak ↓ ve → yönünde ilerleyerek B noktasına kaç farklı biçimde gidilebilir?

In how many different ways can be gone starting from point A to point B in ↓ and → direction?

A) 7! B) 4! . 3! C) $\frac{7!}{3!\,.\,4!}$ D) 5! E) 4!

4.



A'dan B'ye en kısa yoldan kaç farklı şekilde gidilebilir?

In how many different ways can you go from A to B from the shortest road?

A) 60 B) 45 C) 40 D) 30 E) 15

5. **8 kişilik bir gruptan 3 kişi kaç farklı şekilde seçilebilir?**

A) 40 B) 48 C) 50 D) 56 E) 8!

6. $\binom{n}{5} = \binom{n}{3}$

$\Rightarrow$ **n = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

7. $\binom{10}{x} = \binom{10}{2}$

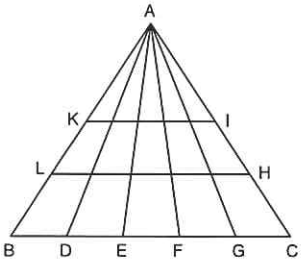
$\Rightarrow$ $\Sigma x = ?$

A) 2 B) 8 C) 10 D) 12 E) 14

8. $\binom{5}{0}+\binom{5}{1}+\binom{5}{2}+\binom{5}{3}+\binom{5}{4}+\binom{5}{5}=?$

A) 32 B) 30 C) 29 D) 28 E) 26

9.

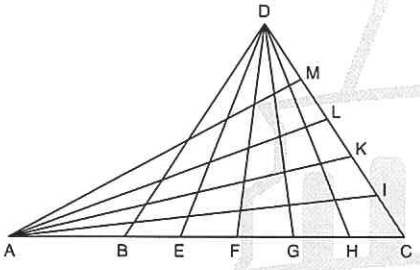


Şekilde kaç farklı üçgen vardır?

How many different triangles are there?

A) 30 B) 35 C) 40 D) 45 E) 55

10.

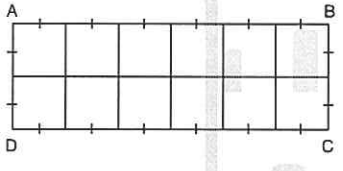


Şekilde kaç farklı üçgen vardır?

How many different triangles are there?

A) 5! B) 135 C) 140 D) 145 E) 150

11.

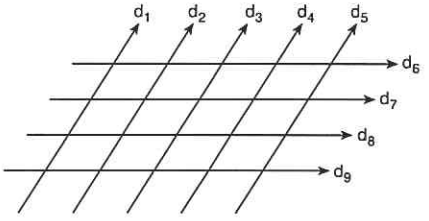


Şekilde kaç farklı dikdörtgen vardır?

How many different rectangles are there?

A) 30 B) 43 C) 53 D) 62 E) 63

12.



$d_1 // d_2 // d_3 // d_4 // d_5$

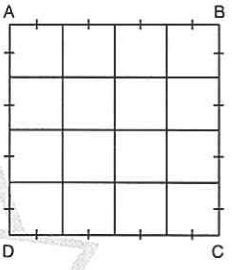
$d_6 // d_7 // d_8 // d_9$

Şekilde kaç farklı paralelkenar vardır?

How many different parallelogram are there?

A) 50 B) 55 C) 60 D) 65 E) 70

13.

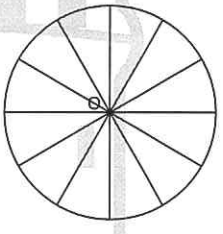


Şekilde kaç farklı kare vardır?

How many different squares are there?

A) 30 B) 32 C) 40 D) 50 E) 100

14.



O merkezli dairede kaç farklı daire dilimi vardır?

How many sectors are there given circle with center O?

A) 30 B) 33 C) 66 D) 132 E) 145

1-B 2-D 3-C 4-A 5-D 6-C 7-C 8-A 9-D 10-B 11-E 12-C 13-A 14-D

1. **5 elemanlı bir kümenin 3 elemanlı alt kümelerinin sayısı kaçtır?**

What is the number of the subsets with 3 elements of the set with 5 elements?

A) 42 B) 20 C) 18 D) 15 E) 10

2. **5 elemanlı bir kümenin en çok 3 elemanlı alt kümelerinin sayısı kaçtır?**

What is the number of the subsets maximum of 3 elements of the set with 5 elements?

A) 25 B) 26 C) 28 D) 30 E) 42

3. 20 kişilik bir gruptan 5 kişi İzmir'e 15 kişi İstanbul'a gidecektir.

Bu iki grup kaç değişik biçimde oluşturulur?

From a group of 20 people 5 people will go to İzmir, 15 people will go to İstanbul. In how many different ways can this two group be formed?

A) $\binom{20}{15}$ B) $\binom{15}{5}$ C) $\binom{20}{6}$ D) $\binom{15}{11}$ E) 15!

4. **8 farklı kalem arasından 6 kalem kaç farklı şekilde seçilebilir?**

In how many different ways can 4 pencils be setected among 10 different pencils?

A) 120 B) 96 C) 48 D) 28 E) 24

5. **10 farklı çikolatanın 3'ü Ali'ye, 7'si Veli'ye kaç farklı şekilde verilebilir?**

In how many different ways can 3 bars of chocolate to Ali, 7 bars of chocolate to Veli be given among 10 different bars of chocolate?

A) 30 B) 60 C) 5! D) 6! E) 10!

6. 7 kız ve 5 erkek arasından 4 kişilik bir grup oluşturulacaktır.

Grupta en az 1 tane erkek bulunmak koşuluyla kaç farklı seçim yapılabilir?

Among 7 girls and 5 boys one group of 4 people will be formed. In how many different ways can this group be formed in such a way that there will be at least one boy?

A) 410 B) 420 C) 430 D) 460 E) 495

7. Zeynep'in de aralarında bulunduğu 8 kişi arasından 4 kişi seçilecektir.

Zeynep'in de bulunduğu kaç değişik seçim yapılabilir?

There is a group of 8 including Zeynep. In how many different ways can 4 people be selected in such a way that Zeynep also will be in?

A) 25 B) 30 C) 35 D) 36 E) 70

8. Özdeş olmayan 2 beyaz, 5 kırmızı, 4 sarı bilye arasından 4 bilye seçilecektir.

Her renkten en az bir bilye alma koşuluyla 4 bilye kaç farklı şekilde seçilebilir?

4 marble will be chosen among 2 white, 5 red, 4 yellow marble which are not identicol. In how many different ways can 4 marble be selected in such a way that there will be at least one marble in each color?

A) 120 B) 160 C) 180 D) 190 E) 320

9. **Ahmet ile Atike'nin de aralarında bulunduğu 7 kişi arasından Ahmet veya Atike'nin içinde bulunduğu 3 kişilik bir grup kaç değişik şekilde seçilebilir?**

There is a group of 7 people including Ahmet and Atike. In how many different ways can a group of 3 people be formed in such away that there will be Ahmet or Atike?

A) 40 B) 35 C) 30 D) 15 E) 10

10. Melis ile Deniz'in de aralarında bulunduğu 10 kişi arasından 5 kişilik bir ekip oluşturulacaktır.

Bu grupların kaçında Melis ile Deniz birlikte bulunmaz?

There is a group of 10 people including Melis and Deniz. In how many different ways a group of 5 people be formed in such a way that Melis and Deniz will not be there at the same time?

A) 48 B) 54 C) 56 D) 60 E) 62

11. **Aynı 3 kimya kitabı her kişiye en fazla 1 kitap vermek koşuluyla 5 kişiye kaç değişik şekilde dağıtılabilir?**

3 same chemistry books will be given to 5 students.

In how many different ways can 5 students take the book in such a way that maximum of one book will be given to each student?

A) 10 B) 13 C) 15 D) 16 E) 60

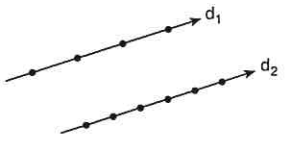
12. **$\{a, b, c, d, e, f, g\}$ kümesinin 4 elemanlı alt kümelerinin kaçında "a" bulunur?**

In how many of the subsets with 4 elements of set $\{a, b, c, d, e, f, g\}$ wil contain "a"?

A) $\binom{6}{1}$ B) $\binom{6}{2}$ C) $\binom{6}{3}$ D) $\binom{7}{4}$ E) $\binom{7}{3}$

1-E 2-B 3-A 4-D 5-C 6-D 7-C 8-B 9-D 10-C 11-A 12-C

1.



$d_1 // d_2$

Şekildeki noktalar kullanılarak kaç tane üçgen oluşturulabilir?

How many triangles can be constructed by using the dots in the figure?

A) 96 B) 95 C) 90 D) 89 E) 88

2. $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 0\}$

kümesinin elemanları ile abc biçiminde üç basamaklı sayılar yazılacaktır.

c < b < a şartıyla kaç farklı sayı yazılabilir?

In how many ways can 3 digit numbers as a, b, c can be written by using the elements of set $\{1, 2, 3, 4, 5, 6, 7, 8, 9, 0\}$ in conditaion that c < b < a?

A) 120 B) 84 C) 83 D) 80 E) 78

3. **Ortak kenara sahip olmayan 5 farklı dörtgen en fazla kaç noktada kesişir?**

What is the maximum number of points of intersection of 5 distinct quadrilateral?

A) 120 B) 80 C) 78 D) 40 E) 36

4. **Çakışık olmayan 10 farklı doğru en fazla kaç noktada kesişir?**

What is the maximum number of points of intersection of 10 different non - overlopping straight lines?

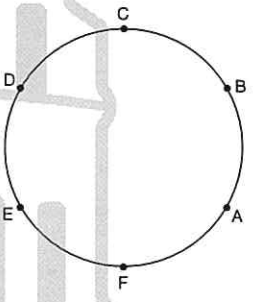
A) 37 B) 39 C) 40 D) 43 E) 45

5. **Farklı yarıçaplı 5 çember en fazla kaç farklı noktada kesişir?**

What is the maximum number of points of intersection of 5 circles with different radius?

A) 40 B) 35 C) 20 D) 15 E) 10

6.



Şekildeki çemberin üzerinde bulunan 6 nokta ile kaç farklı üçgen çizilebilir?

How many different triangles can be drawn with the candition of using the 6 points on the circle in the figure above as the edges of triangles?

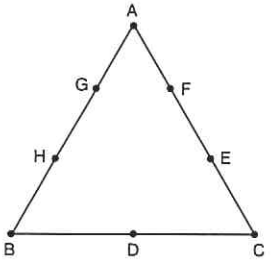
A) 23 B) 22 C) 21 D) 20 E) 15

7. **4 ü paralel, 2 si bir K noktasından geçen 10 farklı doğru, en fazla kaç farklı noktada kesişir?**

What is the maximum number of points of intersection of 10 different line if 4 of them are parallel and 2 of them intersects point K?

A) 39 B) 40 C) 41 D) 42 E) 43

8.

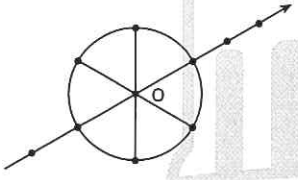


ABC üçgeninde verilen 8 farklı nokta kaç farklı doğru belirtir?

How many different line do 8 points given on ABC triangle indicate?

A) 20 B) 19 C) 18 D) 17 E) 16

9.

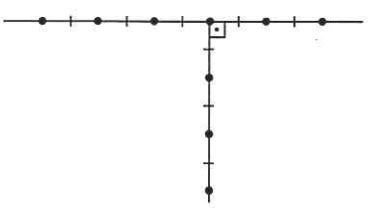


Şekilde verilen noktalar kaç üçgen belirtir?

How many triangle will the points given on the figure define?

A) 100 B) 98 C) 96 D) 90 E) 88

10.

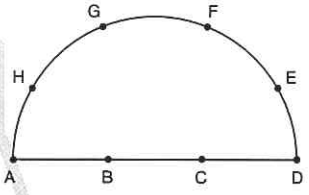


Şekilde verilen noktalar kaç dik üçgen belirtir?

How many right - angled triangle will be points given on the figure define?

A) 15 B) 16 C) 17 D) 18 E) 19

11.



Şekilde verilen noktalar kaç doğru belirtir?

How many line will the points given on the figure define?

A) 21 B) 22 C) 23 D) 24 E) 25

12. **Bir hastanede çalıştırılmak üzere 5 doktor, 4 hemşire ve 6 hasta bakıcı arasından 2 doktor, 1 hemşire ve 1 hasta bakıcı kaç farklı şekilde seçilebilir?**

In how many different ways can 2 doctor, 1 nurse and 1 caregiver be accepted for a job in a hospital from amog 5 doctors, 4 nurses and b caregivers?

A) 240 B) 120 C) 100 D) 80 E) 60

1-A 2-A 3-B 4-E 5-C 6-D 7-A 8-E 9-B 10-C 11-C 12-A

TEST 1

1. **Bir avcının hedefi vurma olasılığı $\frac{3}{5}$ ise bu avcının hedefi vuramama olasılığı kaçtır?**

If the probability of a hunter's hitting the target is $\frac{3}{5}$, what is the probability of him not hitting the target?

A) $\frac{1}{5}$ B) $\frac{2}{5}$ C) $\frac{3}{5}$ D) $\frac{4}{5}$ E) 1

2. Bir madeni para ile bir zar aynı anda havaya atılıyor.

Buna göre, paranın tura ve zarın 4'ten büyük sayı gelme olasılığı kaçtır?

A coin is tossed and a dice is rolled at the same time. What is the probability of getting a head and getting a number greater than 4?

A) $\frac{1}{6}$ B) $\frac{2}{3}$ C) $\frac{3}{5}$ D) $\frac{1}{4}$ E) $\frac{3}{4}$

3. **3 madeni para atıldığında <u>en az</u> bir tura gelme olasılığı kaçtır?**

When 3 coins thrown, what is possibility of at least one is round?

A) $\frac{1}{8}$ B) $\frac{3}{8}$ C) $\frac{5}{8}$ D) $\frac{7}{8}$ E) $\frac{1}{4}$

4. **Bir madeni para art arda 4 kez atıldığında ikisinin yazı, ikisinin tura gelme olasılığı kaçtır?**

When a coin is thrown 4 times repeatedly.

What is the possibility of 2 become letters and 2 become round?

A) $\frac{1}{4}$ B) $\frac{3}{8}$ C) $\frac{1}{2}$ D) $\frac{5}{8}$ E) $\frac{3}{4}$

5. Bir zar ile bir metal para aynı anda havaya atılıyor.

Paranın tura ve zarın 3 gelme olasılığı kaçtır?

A dice is rolled and a coin is tossed at the same time.

What is the probability of getting a head and getting 3?

A) $\frac{1}{2}$ B) $\frac{1}{6}$ C) $\frac{1}{12}$ D) $\frac{2}{3}$ E) $\frac{1}{8}$

6. Bir çift zar atılıyor.

Her iki zarın da asal sayı gelme olasılığı kaçtır?

2 coins are tossed.

What is the probability of getting 2 prime numbers?

A) $\frac{1}{12}$ B) $\frac{1}{8}$ C) $\frac{1}{6}$ D) $\frac{1}{5}$ E) $\frac{1}{4}$

7. **İki zar atıldığında üst yüzlere gelen sayılarının toplamının 7 olma olasılığı kaçtır?**

When two laminans are thrown.

What is the possibility of their top sides sum become 7?

A) $\frac{1}{6}$ B) $\frac{5}{36}$ C) $\frac{1}{9}$ D) $\frac{1}{12}$ E) $\frac{1}{2}$

8. Anne, baba ve 3 çocuktan oluşan bir aile yuvarlak bir masa etrafında rastgele oturacaklardır.

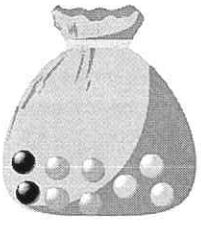
Buna göre, anne ile babanın yan yana oturmuş olma olasılığı kaçtır?

A family that consists of mother, a father and 3 kids will be seated around a round table.

What is the probability of appearing side by side for mother and father?

A) $\frac{3}{5}$ B) $\frac{2}{3}$ C) $\frac{1}{2}$ D) $\frac{1}{3}$ E) $\frac{1}{4}$

9.



Bir torbada 2 siyah, 3 turuncu, 4 yeşil top vardır.

Çekilen bir topun yeşil olma olasılığı kaçtır?

In a bag there are 2 black, 3 orange and 4 green balls.

What is the possibility of the ball being green when we want to take one randomly?

A) $\frac{2}{9}$ B) $\frac{4}{9}$ C) $\frac{1}{3}$ D) $\frac{3}{5}$ E) $\frac{1}{2}$

10. 5 evli çiftin arasından rastgele seçilen 2 kişinin karı - koca olma olasılığı kaçtır?

What is the probability of choosing a married couple when 2 persans are chosen randamly from among 5 married couple?

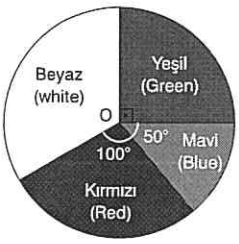
A) $\frac{1}{2}$ B) $\frac{2}{5}$ C) $\frac{1}{10}$ D) $\frac{1}{9}$ E) $\frac{1}{8}$

11. Üç atın yarıştığı bir koşuda A atının kazanma olasılığı $\frac{1}{5}$, B atının kazanma olasılığı $\frac{2}{3}$ ise C atının kazanma olasılığı kaçtır?

3 horses are racing if the winning possibility of horse A $\frac{1}{5}$, horse B's 2 winning possibility is $\frac{2}{3}$ what is the possibility of winning of horse C?

A) $\frac{1}{5}$ B) $\frac{3}{10}$ C) $\frac{2}{15}$ D) $\frac{3}{5}$ E) $\frac{13}{15}$

12.



Şekildeki O merkezli dairesel hedef tahtasını her atışta vuran bir atıcının ilk atışta beyaz bölmeyi vurma olasılığı kaçtır?

What is the probability of shooting the white painted area for a shooter that shoots the circle formed target in the figure each time he tries?

A) $\frac{1}{6}$ B) $\frac{1}{5}$ C) $\frac{1}{4}$ D) $\frac{1}{3}$ E) $\frac{1}{2}$

13. Bir zar atıldığında üst yüze asal sayı geldiği bilindiğine göre, çift sayı gelme olasılığı kaçtır?

What is the probability of getting an even number if getting a prime number is known when a dice is rolled?

A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{2}{3}$ D) $\frac{3}{5}$ E) $\frac{5}{6}$

14. Hileli bir madeni paranın yazı gelme olasılığı $\frac{2}{5}$ tir.

İki kez art arda atılan paranın <u>en az</u> bir kez yazı gelme olasılığı kaçtır?

A tricky coins be on its letter side possibility $\frac{2}{5}$.

If we throw it 2 times in a sequence what is the possibility of at least the coin be on its letter sid?

A) $\frac{3}{5}$ B) $\frac{4}{25}$ C) $\frac{7}{25}$ D) $\frac{8}{25}$ E) $\frac{16}{25}$

1-B 2-A 3-D 4-B 5-C 6-E 7-A 8-C 9-B 10-D 11-C 12-D 13-B 14-E

1. $(5a - 2)^5$

ifadesinin sabit terimi kaçtır?

What is the constant term of $(5a - 2)^5$ expression?

A) 32 B) 16 C) 0 D) – 16 E) – 32

2. $(5x - 2y)^4$

ifadesinin açılımındaki katsayılar toplamı kaçtır?

What is the sum of expansion of fators of $(5x - 2y)^5$ expression?

A) 1 B) 5 C) 25 D) 81 E) 625

3. $\left(2x^5 - \frac{1}{x^2}\right)^7$

ifadesinin sabit terimi kaçtır?

What is the constant term of the expression?

A) – 84 B) – 21 C) 4 D) 21 E) 84

4. $\left(3a + \frac{1}{a}\right)^8$

ifadesinin sabit terimi kaçtır?

What is the constant term of the expression?

A) $\binom{8}{4}$ B) $\binom{8}{3}$ C) $3^4 . \binom{8}{4}$ D) 1 E) 0

5. $\left(\frac{x^3 - y^3}{x^3 . y^3}\right)^6 = \ldots + k . \frac{1}{x^9} . y^m + \ldots$

$\Rightarrow$ **k + m = ?**

A) 29 B) 42 C) – 39 D) – 42 E) – 29

6. $(2a^2 - b)^8 = \ldots + k . a^n . b^6 + \ldots$

$\Rightarrow$ **k + n = ?**

A) 114 B) 116 C) 120 D) 125 E) 132

7. $\left(3x - \frac{1}{x}\right)^5$

ifadesinin açılımındaki x^3 lü terimin katsayısı kaçtır?

What is the expansion coefficient of x^3?

A) 78 B) 79 C) 81 D) – 405 E) – 81

8. $x^2 . \left(\frac{2}{\sqrt{x}} - \frac{x}{2}\right)^9$

ifadesinin açılımındaki x^5 li terimin katsayısı kaçtır?

What is the expansion coefficient of x^5?

A) 36 B) 63 C) 0 D) – 36 E) – 63

9. $(x - 2y + z)^n = \ldots + Ax^2 y^2 z^3 + \ldots$

$\Rightarrow$ **A = ?**

A) 840 B) 420 C) 210 D) 105 E) 35

10. $(x + y + z)^{15} = \ldots + Ax^5 y^4 z^6 + \ldots$

$\Rightarrow$ **A = ?**

A) $\binom{15}{3}\binom{10}{2}$ B) $\binom{15}{3}\binom{10}{3}$ C) $\binom{15}{5}\binom{10}{3}$

D) $\binom{15}{5}\binom{10}{6}$ E) $\binom{10}{5}\binom{5}{3}$

11. $\left(\sqrt[3]{3} + \sqrt{5}\right)^5$

ifadesinin açılımındaki rasyonel sayı kaçtır?

$\left(\sqrt[3]{3} + \sqrt{5}\right)^5$ what is the expansion rational number of this expression?

A) 110 B) 120 C) 130 D) 140 E) 150

12. $(1 + \sqrt{2})^7 = \ldots + A + \ldots$

$A \in Q$ (Rational number)

$\Rightarrow$ **max(A) = ?**

A) 42 B) 56 C) 140 D) 150 E) 280

13. $(2x + 1)^{12}$

ifadesinin açılımı x'in azalan kuvvetine göre dizildiğinde baştan 4. terimi nedir?

If the expansion of expression $(2x + 1)^{12}$ is sequenced by x's lowering powers what is the 4th term form the begining?

A) $C(12, 3) \cdot 2^9 \cdot x^9$ B) $C(12, 3) \cdot x^9$

C) $C(12, 4) \cdot 2^8 \cdot x^8$ D) $C(12, 4) \cdot x^8$

E) $C(13, 4) \cdot 2^9 \cdot x^9$

14. $(a - 5b)^8$

ifadesinin açılımı a'nın azalan kuvvetlerine göre dizildiğinde sondan 6. terimi nedir?

If the expansion of expression $(a - 5b)^8$ is sequenced by a's lowering powers what is the six th term form the end?

A) $\binom{8}{6} \cdot 25 \cdot a^6 \cdot b^2$ B) $-\binom{8}{5} \cdot 125 \cdot a^5 \cdot b^3$

C) $-\binom{8}{6} \cdot 25 \cdot a^6 \cdot b^2$ D) $\binom{8}{5} \cdot 125 \cdot a^5 \cdot b^3$

E) $\binom{8}{2} \cdot 25 \cdot a^6 \cdot b^2$

15. $(3x^2 - 5y^3)^4$

ifadesinin açılımı x'in azalan kuvvetine göre dizildiğinde ortadaki terimi nedir?

If the expansion $(3x^2 - 5y^3)^4$ is sequenced by x's lowering powers what is the middle term?

A) $1350 \cdot x^2 \cdot y^3$ B) $350 \cdot x^2 \cdot y^3$

C) $1350 \cdot x^4 \cdot y^6$ D) $350 \cdot x^4 \cdot y^6$

E) $135 \cdot x^4 \cdot y^6$

1-E 2-D 3-A 4-C 5-E 6-B 7-D 8-E 9-A 10-D 11-E 12-C 13-A 14-B 15-C

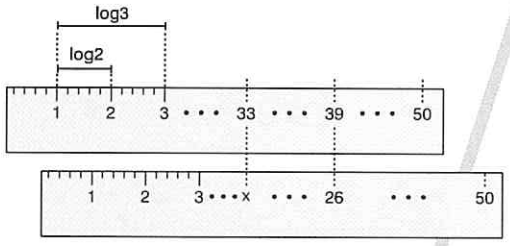
1. $\ln x + \ln y = 10$

$\ln x - \ln y = 6$

$\Rightarrow \log_y x = ?$

A) 2 B) 4 C) 6 D) 8 E) 10

2.



$\Rightarrow x = ?$

A) 19 B) 20 C) 21 D) 22 E) 23

3. I. $24 = 2 \cdot 3 \cdot 4 = e^{\ln 2} \cdot e^{\ln 3} \cdot e^{\ln 4}$

II. $e^{\ln 2} \cdot e^{\ln 3} \cdot e^{\ln 4} = e^{\ln 2 + \ln 3 + \ln 4}$

III. $e^{\ln 2 + \ln 3 + \ln 4} = e^{\ln 24}$

IV. $e^{\ln 24} = e^{\ln(4 + 20)}$

V. $e^{\ln(4 + 20)} = e^{\ln 4 + \ln 20}$

VI. $e^{\ln 4 + \ln 20} = e^{\ln 4} \cdot e^{\ln 20}$

VII. $e^{\ln 4} \cdot e^{\ln 20} = 4 \cdot 20 = 80$

$\Rightarrow 24 = 80$

İlk hata hangi adımda yapılmıştır?

In which step the firs mistake was mode?

A) III B) IV C) V D) VI E) VII

4. $\log_4 64! = a$

$\Rightarrow \log_4 63! = ?$

A) a – 3 B) a C) a + 3 D) a + 4 E) a + 64

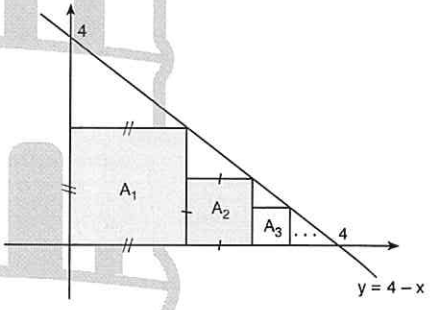
5. $x^2 - 25x + 16 = 0$

$f(x_1) = f(x_2) = 0$

$\Rightarrow \sqrt{6 + \sqrt{\frac{x_1}{x_2}} + \sqrt{\frac{x_2}{x_1}}} = ?$

A) $\frac{25}{4}$ B) $\frac{15}{4}$ C) $\frac{15}{2}$ D) 3,5 E) 2,5

6.



- $A_1, A_2, A_3 \ldots A_k$ kare (square)
- $\sum_{n=1}^{\infty} A(A_n) = \frac{a}{b}$

$\Rightarrow a + b = ?$

A) 23 B) 19 C) 18 D) 17 E) 16

7. (a_n) bir dizi (sequence)

- $a_k + a_{k+1} + a_{k+2} = a_t + a_{t+1} + a_{t+2}$
- $a_2 + a_3 = a_4 = 2$

$\Rightarrow \sum_{k=1}^{25} a_k = ?$

A) 40 B) 38 C) 36 D) 35 E) 34

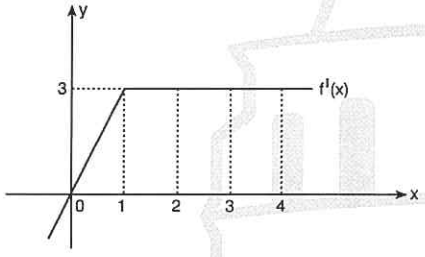
8. $a > 0$

$\int_a^b f(t)\,dt = 5b^2 - 45$

$\Rightarrow$ **a = ?**

A) – 3 B) 1 C) 2 D) 3 E) 9

9.



$f(0) = 2$

$\Rightarrow$ **f(4) = ?**

A) $\frac{67}{6}$ B) $\frac{55}{6}$ C) 6 D) 3 E) 1

10. $\int_0^{\frac{\pi}{2}} (\cos^3 x - \sin^3 x)\,dx = ?$

A) π B) – 1 C) 2 D) 1 E) 0

11. $\lim_{x \to 0} \frac{\sin(x^2) - 6x}{x + \tan 3x} = ?$

A) $\frac{3}{2}$ B) $\frac{1}{2}$ C) $-\frac{3}{2}$ D) $-\frac{1}{2}$ E) – 2

12. $\lim_{x \to 0^+} \sqrt[x]{1 + 4x^2} = y$

$\Rightarrow$ **y = ?**

A) 1 B) e C) e^2 D) $e^{\frac{1}{x}}$ E) ∞

13. $f(x) = x^2 - 5x^3$

$g(x) = ax^2 + \frac{bx^3}{4}$

f ve g fonksiyonlarının her noktadaki türevleri eşit olduğuna göre, a + b = ?

If the derivatives of f and g are equal at each point then a + b = ?

A) 21 B) 20 C) 19 D) – 19 E) – 20

14. $f(x) = \int_1^{x^2} (t + 2)\,dt$

$\Rightarrow$ **f'(1) = ?**

A) 6 B) 3 C) 2 D) 1 E) 0

1-B 2-D 3-C 4-A 5-D 6-B 7-E 8-D 9-A 10-E 11-C 12-A 13-D 14-A

TEST 2

1. $\log(x-3) + \log(x+6) = 1$

Yukarıdaki denklemi sağlayan x değerlerinin toplamı kaçtır?
What is the sum of values of x that sotisfy the above equation?

A) -7 B) -3 C) 4 D) 5 E) 6

2. $x > 1$

$a = \log_{x-3} x^{-5}$

$b = \log_{\frac{1}{x^3}} x^5$

$c = \log_{x^5} x^{-3}$

Aşağıdaki sıralamalardan hangisi doğrudur?
Which of the following order is correct?

A) $a > b > c$ B) $c > b > a$ C) $a > c > b$
D) $b > a > c$ E) $b > c > a$

3. $$f(x) = \begin{cases} a^2x + b, & x < 1 \\ 3x + 2, & x = 1 \\ x^2 + 3x + 2, & x > 1 \end{cases}$$

f fonksiyonunun x = 1 noktasında limitinin olması için a ile b arasındaki bağıntı nedir?

What is the relation between a and b for which the function "f" has limit at the point x = 1?

A) $a + b = 5$ B) $a + b = 1$ C) $a + b = 6$
D) $a \cdot b = 5$ E) $a \cdot b = 1$

4. $$\lim_{x \to y+1} \frac{x^3 - 3x^2y + 3xy^2 - y^3 - 1}{x^2 + y^2 - 2xy - 1} = ?$$

A) $\frac{1}{2}$ B) $\frac{3}{2}$ C) $\frac{5}{2}$ D) $\frac{7}{2}$ E) 1

5. $$\boxed{x} = \begin{cases} 0!, & x = 1 \\ \boxed{x+1} = x \cdot \boxed{x}, & x > 1 \end{cases}$$

$\Rightarrow \boxed{90} = ?$

A) 90! B) 89! C) 88! D) 87! E) 91!

6. $$\lim_{x \to 1} \frac{1 - \cos(2x-2)}{\sin^2(3x-3)} = ?$$

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) $\frac{1}{9}$ D) $\frac{2}{9}$ E) 0

7. $i^2 = -1$

$$\Rightarrow \left| \frac{(3+4i)^2 \cdot (-5+12i)}{(7-24i)} \right| = ?$$

A) 5 B) 7 C) 13 D) 25 E) 65

8. $\log_x(12 + \log_x 16) = 4\sin^2 x + 4\cos^2 x$

$\Rightarrow$ **x = ?**

A) 1 B) 2 C) 4 D) 16 E) 20

9. $\int_{10}^{10} f(x)dx = f(x) - \sin^2 x$

$\Rightarrow$ **f'(x) = ?**

A) $\sin^2 x$ B) $\cos^2 x$ C) $\sin 2x$ D) $\cos 2x$ E) 10

10. $0 < x < 2$

$f(x) = \sqrt{\sqrt{x^2 - 4x + 4} + (x^2 - 5x + 7)}$

$\Rightarrow \lim_{x \to 20} \frac{f(x) - f(20)}{x - 20} = ?$

A) – 1 B) 1 C) 0 D) 20^{20} E) 20!

11. f(x) fonksiyonu birebir ve örtendir.

Let f: A $\to$ B be a one to one and onto function.

- f(1) = 2 f(3) = 5
- $\int_1^3 x\, f'(x)dx = 6$

$\Rightarrow \int_2^5 f^{-1}(x)dx = ?$

A) 6 B) 8 C) 9 D) 10 E) 11

12. $\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x + \cos x} = ?$

A) $\frac{\pi}{2}$ B) $\frac{\pi}{3}$ C) $\frac{\pi}{4}$ D) $\frac{\pi}{5}$ E) $\frac{\pi}{6}$

13. • $f(x) = \arctan\left(\frac{1}{x^2 + x + 1}\right)$

• $A = \sum_{k=1}^{14} f(k)$

$\Rightarrow$ **tanA = ?**

A) $\frac{2}{5}$ B) $\frac{1}{4}$ C) $\frac{13}{16}$ D) $\frac{15}{16}$ E) $\frac{7}{8}$

14. • $f(x) = (x - 1) \cdot (x - 2) \cdot (x - 3) \cdot \ldots \cdot (x - 9)$

• $\int_1^9 f(x)\, dx = A$

$\Rightarrow$ **A = ?**

A) 0 B) 1 C) 9 D) 9! E) 9^9

15. $A + B = \begin{bmatrix} 5 & 2 \\ -1 & -2 \end{bmatrix}$

$2A - B = \begin{bmatrix} 1 & -5 \\ -2 & 11 \end{bmatrix}$

$\Rightarrow$ **det(A . B) = ?**

A) – 75 B) – 15 C) – 5 D) 5 E) 15

1-C 2-C 3-C 4-B 5-B 6-D 7-C 8-B 9-C 10-A 11-A 12-C 13-E 14-A 15-A

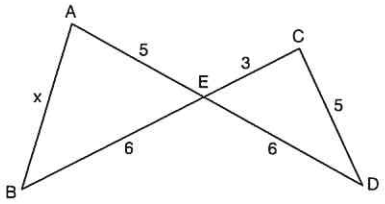
TEST 3

1. $\tan\alpha + \cot\alpha = 3$

$\Rightarrow$ **$\tan^4\alpha + \cot^4\alpha = ?$**

A) 49 B) 47 C) 44 D) 9 E) 7

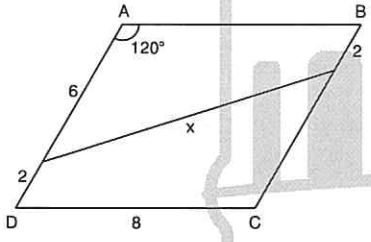
2.



$\Rightarrow$ **$x = ?$**

A) $\sqrt{\frac{80}{3}}$ B) $\frac{\sqrt{80}}{3}$ C) $\sqrt{\frac{83}{3}}$ D) $\frac{\sqrt{83}}{3}$ E) 7

3.



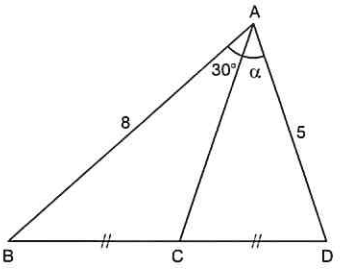
ABCD paralelkenar (parallelogram)

$\Rightarrow$ **$x = ?$**

A) $\sqrt{7}$ B) $2\sqrt{7}$ C) $4\sqrt{7}$

D) $2\sqrt{3}$ E) $4\sqrt{3}$

4.

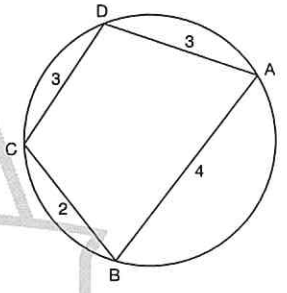


$|DC| = |CB|$

$\Rightarrow$ **$\sin\alpha = ?$**

A) $\frac{5}{8}$ B) $\frac{4}{5}$ C) $\frac{3}{5}$ D) $\frac{8}{5}$ E) $\frac{5}{4}$

5.



$\Rightarrow$ **$\cos(\widehat{BCD}) = ?$**

A) $\frac{1}{3}$ B) $\frac{2}{3}$ C) 1 D) $-\frac{2}{3}$ E) $-\frac{1}{3}$

6. $\sin1° = x$

$\Rightarrow$ **$\frac{1}{\cos0° \cdot \cos1°} + \frac{1}{\cos1° \cdot \cos2°} + \frac{1}{\cos2° \cdot \cos3°} + \ldots + \frac{1}{\cos44° \cdot \cos45°} = ?$**

A) $1 + x$ B) $1 - x$ C) x D) $\frac{1}{x}$ E) $x^2 - 1$

7. $a - b = \frac{\pi}{6}$

$\Rightarrow$ **$(\cos a + \cos b)^2 + (\sin a + \sin b)^2 = ?$**

A) $2\sqrt{3}$ B) $4 - \sqrt{3}$ C) $4 + \sqrt{3}$

D) $2 - \sqrt{3}$ E) $2 + \sqrt{3}$

8. $\text{Arg}(z + 2 - 3i) = \frac{4\pi}{3}$

$z = x + yi$

$y = ax + b$

$\Rightarrow$ **$y = ?$**

A) $y = \sqrt{3}x$ B) $y = \sqrt{3}x + 2$ C) $y = \sqrt{3}x + 3$

D) $y = \sqrt{3}x + 2\sqrt{3} + 3$ E) $y = x + \sqrt{3} + 3$

9. $z = \frac{3.(\cos 300° - i.\sin 300°) \,.\, 6.(\sin 460° - i.\cos 460°)}{-9.[\cos(-220°) + i.\sin(220°)]}$

$z = r \,.\, \text{cis}\theta$

$\Rightarrow$ **$z = ?$**

A) $2.\text{cis}30°$ B) $\text{cis}150°$ C) $2.\text{cis}10°$

D) $-\frac{3}{2}\,\text{cis}240°$ E) $2.\text{cis}50°$

10. $A = \begin{bmatrix} 3 & -1 \\ 3 & -2 \end{bmatrix}$

$\Rightarrow$ **$\big||A| \,.\, Ek(A)\big| = ?$**

A) -36 B) -27 C) -9 D) 9 E) 18

11. (a_n) aritmetik dizi (arithmetical sequence)

$a_{11} = \begin{bmatrix} -3 & 2 \\ 0 & 1 \end{bmatrix}$

$d = \begin{bmatrix} 1 & 0 \\ 4 & 1 \end{bmatrix}$

$\Rightarrow$ **$a_{16} = ?$**

A) $\begin{bmatrix} 2 & 2 \\ 20 & 6 \end{bmatrix}$ B) $\begin{bmatrix} 2 & 7 \\ 20 & 6 \end{bmatrix}$ C) $\begin{bmatrix} 2 & 2 \\ 0 & 6 \end{bmatrix}$

D) $\begin{bmatrix} -2 & 2 \\ 10 & 6 \end{bmatrix}$ E) $\begin{bmatrix} 3 & 2 \\ 24 & 7 \end{bmatrix}$

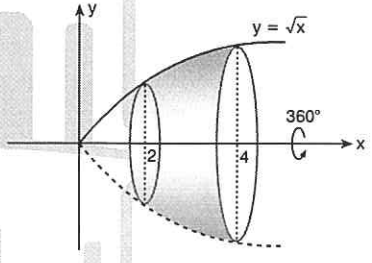
12. $\int e^x \,.\, \sin x\, dx = ?$

A) $e^x \frac{(\sin x + \cos x)}{2} + c$ B) $e^x \frac{(\sin x - \cos x)}{2} + c$

C) $e^x \frac{(\sin x - 1)}{2} + c$ D) $e^x \frac{(\sin x + 1)}{2} + c$

E) $e^x \frac{(\cos x + 1)}{2} + c$

13.



Şekildeki dönel cismin hacmi kaç br^3 tür?

What is the volume of the solid of revolution in the figure in terms of br^3?

A) 14π B) 12π C) 10π D) 8π E) 6π

1-B 2-C 3-C 4-B 5-E 6-D 7-E 8-D 9-A 10-B 11-A 12-B 13-E

1. $a \neq 1$

$a, b, c > 0$

$abc = 1$

$\Rightarrow \log_a b^2 + \log_{\sqrt{a}} c = ?$

A) -2 B) -1 C) $\frac{1}{2}$ D) 1 E) 2

2. $P(-x) + P(x-1) = x^2 + ax$

$\Rightarrow P\left(-\frac{1}{2}\right) = ?$

A) $\frac{1}{2}$ B) 1 C) $-\frac{1}{2}$ D) $\frac{1}{4}$ E) $-\frac{1}{8}$

3. $|x-1| \leq \frac{2}{x}$

eşitsizliğinin çözüm kümesi aşağıdakilerden hangisidir?

What is the solution set of the inequality?

A) $[1, 2]$ B) $(0, \infty)$ C) $[-1, 2)$ D) $(0, 2]$ E) $[2, \infty)$

4. $n \in N,$

$$\sum_{k=1}^{n} f(k+1) = \frac{\cos\left(\frac{n\pi}{2}\right)}{n+2}$$

$\Rightarrow f(15) = ?$

A) $\frac{1}{15}$ B) 1 C) $-\frac{1}{15}$ D) 0 E) $-\frac{1}{16}$

5. $3x^3 + x^2 + x = -\frac{1}{3}$

$\Rightarrow \frac{x+1}{2} = ?$

A) $-\frac{1}{9}$ B) -3 C) 1 D) $\frac{1}{3}$ E) $\frac{1}{9}$

6. $z = \sqrt{3} + i$

$\Rightarrow \left(\frac{z}{2} + \frac{2}{z}\right)^2 + 2 = ?$

A) 2 B) 3 C) 4 D) 5 E) 1

7. $\alpha \in \left(-\frac{\pi}{2}, 0\right)$

$\cos\alpha - \sec\alpha = \sqrt{5}$

$\Rightarrow \cos\alpha + \sec\alpha = ?$

A) -2 B) -1 C) 1 D) 2 E) 3

8. $\log_6 2 = x$

$\Rightarrow \log_{18} 3 = ?$

A) $\frac{3x}{1-x}$ B) $2 - \frac{1}{x}$ C) $\frac{1-x}{2-x}$ D) $1 + \frac{1}{x}$ E) $\frac{2+x}{1-x}$

9. $n > 2$

$C(n, 2) + P(n, 2) = 3 + 6 + 9 + \ldots + 27$

$\Rightarrow$ **n = ?**

A) 9 B) 16 C) 10 D) 15 E) 13

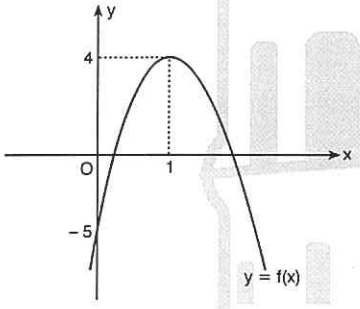
10. $P(ax + b) = x^2 - 4x$

bir polinom olduğuna göre, P(x) + a + b ifadesi aşağıdakilerden hangisine eşittir?

What is the equation of $P(x) + a + b$ if it is a polynomial?

A) $x^2 - 1$ B) $x^2 - 2$ C) $x^2 - 3$ D) $x^2 - 4$ E) $x^2 - 5$

11.



$f(x) = a(x - b)(x + c)$

$\Rightarrow$ **a . b . c = ?**

A) – 6 B) – 5 C) – 4 D) 4 E) 5

12. $S = \cos x + \sin x + \frac{\cos^2 x}{\sin x} + \frac{\sin^2 x}{\cos x}$

$C = \cos x - \sin x$

$\Rightarrow$ **S . C = ?**

A) cos2x B) 2tanx C) sin2x D) 2cot2x E) 2tan2x

13. $n \in Z^+$

$a_{n+2} = 2a_{n+1} - a_n + 1$

$a_9 = a_8 + 4$

$\Rightarrow$ **$a_{25} - a_{24}$ = ?**

A) 20 B) 21 C) 24 D) 25 E) 28

14. $x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

$\frac{1}{\sin x + 1} + \frac{1}{\sin x - 1} + \frac{4}{3} = 0$

$\Rightarrow$ **Σx = ?**

A) π B) $\frac{5\pi}{6}$ C) $\frac{2\pi}{3}$ D) $\frac{\pi}{2}$ E) $\frac{\pi}{6}$

15. $\left.\begin{matrix} x^2 + xy - y^5 = 3 \\ y = f(x) \end{matrix}\right\}$ $f'(5) = ?$

A) $-\frac{1}{5}$ B) $\frac{2}{25}$ C) $-\frac{3}{5}$ D) $\frac{4}{25}$ E) -1

16. $\lim\limits_{x \to \infty} \left[\frac{x^3}{x+8} \cdot \tan\left(\frac{1}{x^2}\right)\right] = ?$

A) 3 B) 2 C) 1 D) $\frac{1}{8}$ E) $\frac{3}{2}$

17. $f: R^+ \to R^+$

$f^2(\ln x) = 2 - 2\cos 2x$

$\Rightarrow \frac{df(x)}{dx} = ?$

A) $-\cos 4x$ B) $e^{2x} \cdot \sin(2x)$ C) $2e^x \cdot \cos(e^x)$

D) $e^x \cdot \sin(2e^x)$ E) $4\sin x$

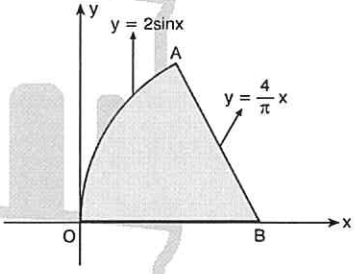
18. $\int_1^2 (x^3 - x)(6x^2 - 6)\,dx?$

A) 8 B) 16 C) 25 D) 27 E) 36

19. $\lim\limits_{p \to \frac{1}{q}} \frac{p^2q - p}{p^2q^2 + pq - 2} = ?$

A) $\frac{q}{2}$ B) $\frac{1}{2p}$ C) $\frac{p}{3}$ D) $\frac{1}{q+2}$ E) $\frac{1}{3q}$

20.



Taralı alan = ? cm^2

Shaded area = ? cm^2

A) $2 - \frac{\pi}{2}$ B) $\pi + 2$ C) $2\pi - 4$

D) $\frac{\pi + 4}{2}$ E) $\frac{2 + \pi}{2}$

1-A 2-E 3-D 4-E 5-D 6-D 7-E 8-C 9-C 10-C 11-E 12-D 13-A 14-E 15-D 16-C 17-C 18-D 19-E 20-D

1. $x^2 - \frac{x}{\sin 15} = \frac{x}{\cos 15} - 4$

Ç.K. (S.S.) = $\{x_1, x_2\}$

$\Rightarrow$ $x_1^2 + x_2^2 = ?$

A) 10 B) 16 C) 20 D) 25 E) 32

2. $\left(i + \frac{i}{2}\right)\left(2i + \frac{2i}{3}\right)\left(3i + \frac{3i}{4}\right) \cdot \ldots \cdot \left(15\,i + \frac{15i}{16}\right) = ?$

A) $\frac{17! \,.\, i}{2^4}$ B) $-\frac{16! \,.\, i}{2^5}$ C) $\frac{15! \,.\, i}{2^4}$

D) $-\frac{17! \,.\, i}{2^5}$ E) $\frac{17!}{2^4}$

3. $P(x + 4) = (x^4 - x)^2 - (x^4 + x)^2$

$\Rightarrow$ $P\left(4 - \frac{1}{\sqrt[5]{2}}\right) = ?$

A) 1 B) $-\sqrt[5]{4}$ C) 2 D) $-\frac{1}{\sqrt[5]{16}}$ E) -4

4. $\log x - \log 2 = \log(x - 2)$

$\Rightarrow$ $\log x + \log 2 = ?$

A) 2 B) log4 C) 4 D) log8 E) log16

5. $A = \begin{bmatrix} \log_9 32 & 3^{\frac{3}{2}} \\ \frac{1}{\sqrt{3}} & \log_{\sqrt{2}} 3 \end{bmatrix}$

$\Rightarrow$ $\det(3A^2) = ?$

A) 12 B) 27 C) 36 D) 48 E) 54

6. $x > \frac{\pi}{4}$

$\tan 4x = \frac{4}{3}$

$\Rightarrow$ $3\cos^2 x + \sin^2 x = ?$

A) $-\frac{1}{\sqrt{5}}$ B) $\frac{-2\sqrt{5} + 10}{5}$ C) $\frac{4}{\sqrt{5}}$

D) $\frac{10 + 2\sqrt{5}}{5}$ E) $\frac{2 + 5\sqrt{5}}{5}$

7. $N = \frac{(1 + i)^{2i}}{2^i}$

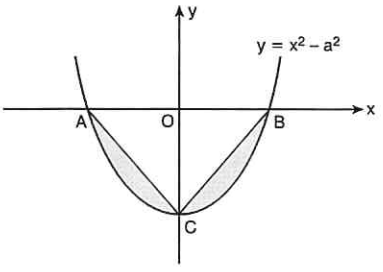
sayısı aşağıdakilerden hangisi olabilir?

Which one of the following values might be equal to the number N?

A) $e^{\frac{\pi}{2}}$ B) $e^{-\frac{3\pi}{2}}$ C) $e^{\frac{3\pi}{2}}$

D) $e^{-\frac{7\pi}{2}}$ E) $e^{\frac{5\pi}{2}}$

8.



Taralı alan = 72 cm²

Shaded area = 72 cm²

$a > 0$

⇒ **a = ?**

A) $2\sqrt{3}$ B) 3 C) $4\sqrt{3}$ D) 6 E) $9\sqrt{2}$

9. $\sum_{k=1}^{10} (-1)^{k^3-1} \cdot (k^2 + k) = ?$

A) – 72 B) 70 C) – 66 D) 64 E) – 60

10. $\frac{x^3 + 3\sqrt{3}}{x\sqrt{3} + 3} + 3x \leq 4\sqrt{3}$

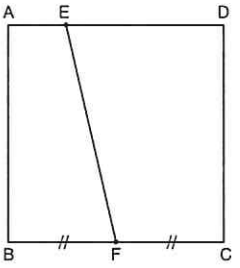
Ç.K. (S.S.) = ?

A) $[-\sqrt{3}, \sqrt{3}) \cup (\sqrt{3}, \infty)$ B) $[-\sqrt{3}, \infty)$

C) $[-3\sqrt{3}, \sqrt{3})$ D) $[-3\sqrt{3}, \sqrt{3}]$

E) $[-3\sqrt{3}, -\sqrt{3}) \cup (-\sqrt{3}, \sqrt{3}]$

11.



ABCD kare

ABCD square

$|BF| = |FC|$

$\frac{A(ABFE)}{A(EFCD)} = \frac{1}{2}$

$m(\widehat{BEC}) = \alpha$

⇒ **$\tan\alpha$ = ?**

A) $-\frac{16}{19}$ B) $\frac{23}{20}$ C) $-\frac{36}{31}$ D) $\frac{29}{25}$ E) $-\frac{50}{49}$

12. İkinci dereceden P(x) polinomunun (x + 1) ile bölümünden kalan – 2, (x – 2) ile bölümünden kalan ise 4 olmak üzere, bu polinomun katsayılar toplamı 10 oluyor.

Buna göre, P(x) polinomunun başkatsayısı kaçtır?

P(x) is a second degree polynomial. It is divided by (x + 1) and (x – 2) and remainders obtained are respectively – 2 and 4.

If the sum of the coeffients of P(x) equals to 10.

What is the leading coeffient of P(x)?

A) 2 B) – 2 C) 10 D) – 4 E) 4

13. $n > 1$,

$$a_n = \binom{n}{1} + \binom{n}{2} + \ldots + \binom{n}{n-1}$$

⇒ **$a_6 - a_5$ = ?**

A) 30 B) 32 C) 34 D) 36 E) 40

14. $f(x) = \dfrac{4^{x+1}}{2^{x+2} - f(x)}$

$\Rightarrow$ **f(x + y) = ?**

A) f(x) + f(y) B) 2f(x) . f(y)

C) $f^2(x) + f^2(y)$ D) $\dfrac{f(x).f(y)}{2}$

E) $\dfrac{f(x) + f(y)}{2}$

15. $f(3) + 6 = f'(3) = 6$

$\Rightarrow \lim\limits_{x \to 3} \dfrac{f(x)}{x^2 - 9} = ?$

A) 3 B) 2 C) 1 D) – 3 E) – 2

16. $f(1) = 1$

$f(5) = 10$

$\int_1^5 \dfrac{f'(x)}{x} dx = -4$

$\Rightarrow \int_1^5 \dfrac{f(x)}{x^2} dx = ?$

A) 4 B) – 5 C) 5 D) – 10 E) 16

17. $\int_{e^2}^{e^6} \dfrac{dx}{x \ln x} = ?$

A) ln2 B) 2 C) ln3 D) 3 E) ln4

18. $y = \sin^3\left(-\dfrac{2}{x}\right)$

$\Rightarrow \dfrac{dy}{dx} = ?$

A) $-\dfrac{6}{x}\sin^2\left(\dfrac{2}{x}\right)\cos\left(\dfrac{2}{x}\right)$ B) $\dfrac{3}{x^2}\sin\left(\dfrac{2}{x}\right)$

C) $-\dfrac{3}{x^2}\sin\left(\dfrac{4}{x}\right)$ D) $\dfrac{3}{x^2}\sin\left(\dfrac{4}{x}\right)\cos\left(\dfrac{2}{x}\right)$

E) $-\dfrac{3}{x}\cos\left(\dfrac{4}{x}\right)$

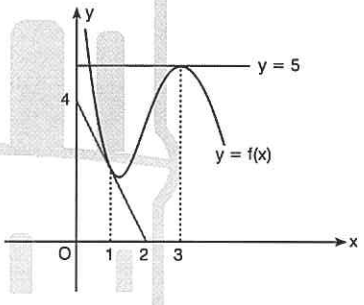
19. $f(x) = 1^3 - 1 + 2^3 - 2 + ... + x^3 - x$

$g(x) = (1 + 2 + ... + x)^2$

$\Rightarrow \lim\limits_{x \to \infty} \left[\dfrac{f(x)}{g(x)}\right] = ?$

A) $-\infty$ B) – 1 C) 0 D) 1 E) ∞

20.



$v(x) = f(3x - 2) + x^2 . f(x + 2)$

$\Rightarrow \left.\dfrac{dv}{dx}\right|_{x=1} = ?$

A) 4 B) 5 C) 6 D) 2 E) 3

1-B 2-D 3-C 4-D 5-C 6-B 7-C 8-D 9-E 10-E 11-C 12-D 13-B 14-D 15-C 16-B 17-C 18-D 19-D 20-A

1. $x_1 = x_2 = 1$

$x_{n+2} = x_{n+1} + x_n, \quad n \geq 1$

olduğuna göre, aşağıdaki terimlerden hangisi bu diziye aittir?

Which one of the following is a term of this sequence?

A) 121 B) 144 C) 169 D) 196 E) 225

2.

$P(x) \mid x + 1$

$-$

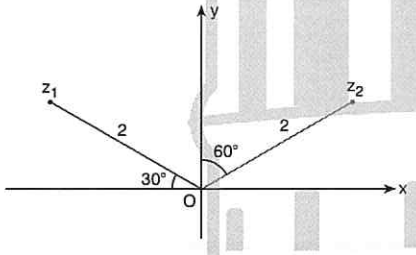
0

$P(x^3 + 1) = x^6 + 5x^4 + ax^3 + bx$

$\Rightarrow$ **a + b = ?**

A) 5 B) 7 C) 9 D) 10 E) 12

3.



$\Rightarrow \dfrac{z_1^2}{z_2} + \dfrac{z_2^2}{z_1} = ?$

A) 2i B) – 2i C) 4i D) – 4i E) 0

4. $\left.\begin{array}{l} \log_a 8 = x \\ \log_x a = \dfrac{3}{x} \end{array}\right\} \Rightarrow \dfrac{a}{x} = ?$

A) $\sqrt{2}$ B) 2 C) $2\sqrt{2}$ D) 4 E) $4\sqrt{2}$

5. $\dfrac{\sin 27 \cdot \sin 3 - \cos 27 \cdot \cos 3}{\cos 54 \cdot \sin 6 + \sin 54 \cdot \cos 6} = ?$

A) – 2 B) – 1 C) 0 D) 1 E) 2

6. $z = \dfrac{(1+i)^5}{(\sqrt{7}-i)^3}$

$\Rightarrow \left|\dfrac{1}{z^2}\right| = ?$

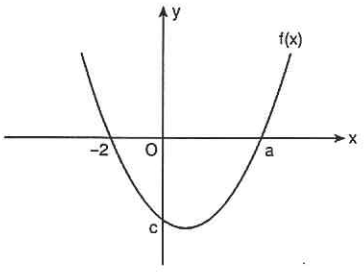
A) 2 B) 4 C) 8 D) 16 E) 32

7. $\sum_{k=1}^{n} \dfrac{n}{2^k} = \dfrac{255}{32}$

$\Rightarrow$ **n = ?**

A) 6 B) 7 C) 8 D) 9 E) 10

8.



$f(x) = x^2 - 2x + b$

$\Rightarrow$ **max(af(x) + b + c) = ?**

A) – 36 B) – 30 C) – 24 D) – 18 E) – 12

9. $f(x) = x^2 + \sqrt[3]{4}x + \sqrt[3]{2}$

$f(x_1) = f(x_2) = 0$

$\Rightarrow \begin{vmatrix} x_1^2 & -x_2 \\ x_2^2 & x_1 \end{vmatrix} = ?$

A) 2 B) 4 C) 8 D) 0 E) – 4

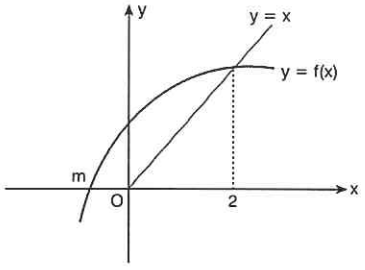
10. Hedefin vurulma olasılığı $\frac{2}{5}$ dir.

Üç el atış yapıldığında bu hedefin isabet ettirilme olasılığı nedir?

What is the probability of reaching a target after 3 shots if getting each shot is equally likely with the probability of $\frac{2}{5}$?

A) $\frac{3}{5}$ B) $\frac{17}{25}$ C) $\frac{98}{125}$ D) $\frac{4}{5}$ E) $\frac{117}{125}$

11.



$f(x) = \log_a(x + a)$

$\Rightarrow$ **f(30) + m = ?**

A) 1 B) 2 C) 3 D) 4 E) 5

12. $\frac{3\pi}{4} < x < \pi$

$\sec 2x = \frac{3\sqrt{2}}{4}$

$\Rightarrow$ **(cosx – sinx)(cos³x + sin³x) = ?**

A) $\frac{\sqrt{2}}{3}$ B) $\frac{3\sqrt{2}}{8}$ C) $\frac{5\sqrt{2}}{9}$ D) $\frac{4\sqrt{2}}{3}$ E) $\frac{7\sqrt{2}}{9}$

13. $A = \begin{bmatrix} 1 & -1 \\ 0 & -1 \end{bmatrix}$

$\Rightarrow$ **A^{20} = ?**

A) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$ B) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ C) $\begin{bmatrix} -1 & 1 \\ 0 & 1 \end{bmatrix}$ D) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ E) $\begin{bmatrix} 1 & -1 \\ 0 & -1 \end{bmatrix}$

14. $x^3 - x^2 = (x + 2)P(x) + a$

$\Rightarrow$ **P(a + 10) = ?**

A) 12 B) 14 C) 16 D) 18 E) 20

15. $\lim\limits_{x \to \frac{1}{3}} \dfrac{27^x - 3}{9x^2 - 1} = ?$

A) $\ln\sqrt{3}$ B) $\ln 3$ C) $\ln 3\sqrt{3}$ D) $-\ln 3$ E) 0

16. $\left.\begin{array}{l} x = (t-1)^2 \\ y = t.e^{-t} \end{array}\right\}$ $\left.\dfrac{d^2y}{dx^2}\right|_{y=0} = ?$

A) $-\dfrac{1}{4}$ B) 0 C) $\dfrac{1}{8}$ D) 1 E) -1

17. $\int_1^8 \sqrt{x^{\frac{1}{2}} \sqrt[3]{x^2\sqrt{x}}}\, dx = ?$

A) 15 B) $\dfrac{81}{5}$ C) 17 D) $\dfrac{93}{5}$ E) 20

18. $f(x) = \dfrac{\cos^2 x}{x^2 + 1}$

$\Rightarrow$ **f'(0) = ?**

A) -1 B) 0 C) 1 D) -2 E) 2

19. $\int_{-1}^{1} [2f(x) + x^3]\, dx = 10$

$\Rightarrow$ $\int_{-1}^{1} [2f(x) - f(-x)]\, dx = ?$

A) -5 B) 0 C) 5 D) 10 E) 15

20. $f(x) = \begin{cases} \dfrac{6}{x^2 - 1}, & x > 2 \\ \dfrac{2}{\log(12 - x)}, & x \le 2 \end{cases}$

foksiyonu kaç noktada süreksizdir?

How many points of discontinuity does function f have?

A) 0 B) 1 C) 2 D) 3 E) 4

1-B 2-E 3-D 4-A 5-B 6-D 7-C 8-A 9-A 10-C 11-D 12-E 13-D 14-C 15-C 16-A 17-D 18-B 19-A 20-A

1. $\left(\frac{2}{1+i}\right)^{100} = ?$

A) $-i \cdot 2^{50}$ B) 2^{50} C) $i \cdot 2^{50}$ D) -2^{50} E) $-i^{50}$

2. $40x = \pi$

$\Rightarrow \frac{\sin 13x + \sin 11x}{\cos 9x + \cos 7x} = ?$

A) -2 B) -1 C) 0 D) 1 E) 2

3. $x^2 + ax + b = 0$

denkleminin çift katlı kökü -4 olduğuna göre, $\frac{a}{b}$ oranı kaçtır?

If this quadratic equation has a double root -4

What is the ratio of $\frac{a}{b}$?

A) $\frac{1}{2}$ B) $\frac{1}{4}$ C) $\frac{1}{8}$ D) $-\frac{1}{2}$ E) $-\frac{1}{4}$

4. $\log_6 2 = m$

$\Rightarrow \frac{1}{1+\log_3 2} + \frac{1}{\log_{12}\frac{1}{6}} = ?$

A) m B) $-2m$ C) $\frac{1}{m}$ D) $-m+2$ E) $\frac{1}{1+m}$

5.

$P(x) \mid x^2 - x$

$-$

$-x + 3$

$P(x+1) \mid x+1$ $\quad$ $P(x+2) \mid x+1$

$-$ $\quad$ $-$

K_1 $\quad$ K_2

$\Rightarrow K_1 + K_2 = ?$

A) 2 B) 3 C) 5 D) 6 E) 7

6. $2^x - a,\ 2^x,\ 2^x + a$

terimleri geometrik bir dizi oluşturduğuna göre, $a + 1 + \frac{1}{a-1}$ ifadesinin değeri kaçtır?

Given terms are belong to a geometric sequence.

What is the value of $a + 1 + \frac{1}{a-1} = ?$

A) 1 B) 2 C) 3 D) 0 E) -3

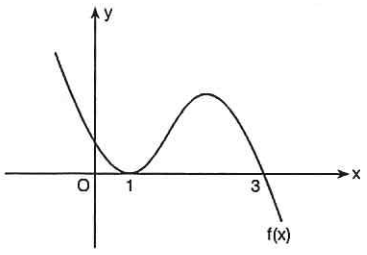
7. $2A - B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$

$A + 2B = \begin{bmatrix} -2 & 5 \\ 5 & -2 \end{bmatrix}$

$\Rightarrow \det(AB) = ?$

A) 2 B) 3 C) 5 D) 6 E) 8

8.



$$\frac{f(x+1)}{x^2-4} \geq 0$$

eşitsizliğinin çözüm kümesi nedir?

What is the solution set of the inequality?

A) $(-2, 2)$ B) $[0, \infty)$ C) $(-\infty, -2) \cup \{0\}$

D) $(-2, 0]$ E) $(-2, 2) \setminus \{0\}$

9. **cot(arccosx) = ?**

A) $\sqrt{1-x^2}$ B) $\frac{\sqrt{1-x^2}}{x}$ C) x

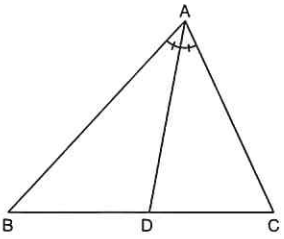
D) $\frac{x}{\sqrt{1-x^2}}$ E) $\frac{1}{x}$

10. $z = \sin 15 + i\cos 15$

⇒ $|z|$. **Arg(z) = ?**

A) 15 B) 30 C) 45 D) 60 E) 75

11.



$m(\widehat{BAD}) = m(\widehat{CAD})$

$|AB| = 64^{\log(3\sqrt{10})}$ cm

$|AC| = 27^{\log(4\sqrt[3]{10})}$ cm

$|BC| = 33$ cm

⇒ $|CD| = ?$

A) 8 B) 9 C) 15 D) 18 E) 24

12. $\frac{x^4-1}{x-1} = k + a(x-2) + b(x-2)^2 + c(x-2)^3$

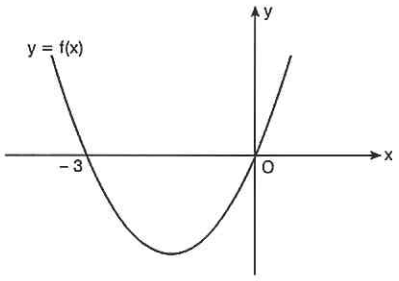
⇒ **k + b = ?**

A) 15 B) 17 C) 20 D) 22 E) 25

13. $\prod_{x=25}^{50} i^{k^2} = ?$

A) $-i$ B) i C) i^{-1} D) 1 E) -1

14.



$\min(f(x)) = -9$

$\Rightarrow f\left(\frac{x-3}{2}\right) = ?$

A) $x^2 - 3$ B) $x^2 - x - 9$ C) $x^2 + x + 3$ D) $x^2 + 3$ E) $x^2 - 9$

15. $f(x) = \int_x^{10} \sqrt{1+y^2}\,dy$

$\Rightarrow \frac{d^2f}{dx^2} = ?$

A) $\frac{1}{2\sqrt{1+x^2}}$ B) $\frac{x}{2\sqrt{1+x^2}}$ C) $-\frac{x}{\sqrt{1+x^2}}$ D) $\frac{x}{\sqrt{1+x^2}}$ E) $-\frac{1}{2\sqrt{1+x^2}}$

16. $a \neq 0$,

$P(x) = x^3 - x$

$(PoP)'(a) + P'(a) = 0$

$\Rightarrow \prod a = ?$

A) 1 B) $-\frac{1}{3}$ C) $\frac{1}{2}$ D) -1 E) $\frac{1}{3}$

17. $\lim_{n \to 0^+} \sqrt[2n]{1-4n} = ?$

A) 2 B) – 4 C) 1 D) – 2 E) 4

18. $\int_1^4 \left(x^2 + \frac{16}{x^2} - 8\right)^{\frac{1}{2}} dx = ?$

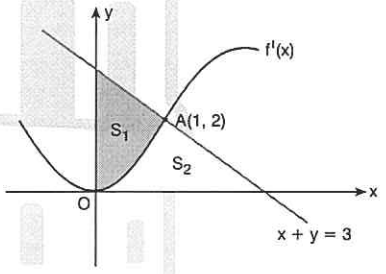
A) 3 B) $\frac{9}{2}$ C) 6 D) $\frac{15}{2}$ E) 9

19. $f(x) = \begin{cases} 2x^2, & x \leq 2 \\ \frac{16}{x}, & x > 2 \end{cases}$

$\Rightarrow \int_1^4 f(x)\,d(\ln x) = ?$

A) 5 B) 3ln2 C) 7 D) ln4 E) 15

20.



$S_1 = S_2$

$\Rightarrow f(1) = ?$

A) $\frac{1}{4}$ B) $\frac{1}{2}$ C) 1 D) $\frac{3}{4}$ E) 2

1-D 2-D 3-A 4-B 5-C 6-D 7-B 8-C 9-D 10-E 11-B 12-D 13-B 14-E 15-C 16-E 17-D 18-B 19-C 20-A

1. $f(n) = \begin{cases} \frac{n}{2}, & n \text{ tek (odd)} \\ \frac{3n+1}{2}, & n \text{ çift (even)} \end{cases}$

$f(f(f(f(n)))) = 1$ ise n sayısı aşağıdakilerden hangisi olamaz?

Which one of the following numbers cannot be equal to n?

A) 1 B) 4 C) 5 D) 8 E) 16

2. $2z + \bar{z} = |z| + i^{-25}$

$\Rightarrow$ **Re(z) = ?**

A) $-\frac{\sqrt{2}}{9}$ B) $\frac{\sqrt{3}}{5}$ C) $-\frac{\sqrt{2}}{4}$ D) $\frac{\sqrt{3}}{8}$ E) $-\frac{\sqrt{5}}{9}$

3. $x \in R^+ \setminus \{1\}$

$\log 2x = 1 + \log_2 5x$

$\Rightarrow$ **$\log_x 20$ = ?**

A) 0 B) 1 C) 2 D) – 1 E) – 2

4. $\sum_{n=0}^{6} a_n x^n = (x^2 + x - 2)^3$

$\Rightarrow$ **$a_1 + a_3 + a_5$ = ?**

A) 4 B) 6 C) 8 D) 9 E) 10

5. $\sin 42 = k$

$\Rightarrow$ $\frac{\sin 72}{\sin 24} + \frac{\cos 72}{\cos 24} = ?$

A) k B) 2k C) 4k D) $\frac{1}{2k}$ E) – k

6. $|x + 9| = x^2 - 11$

denkleminin kaç farklı gerçel çözümü vardır?

How many different real solutions does the equation have?

A) 0 B) 1 C) 2 D) 3 E) 4

7. $\binom{n}{4}, \binom{n}{5}, \binom{n}{6}$

bir aritmetik dizi oluşturuyor.

Buna göre, n sayısının alabileceği farklı değerlerin toplamı kaçtır?

This is an arithmetical sequence.

What is the sum of the values of n?

A) 18 B) 21 C) 28 D) 36 E) 42

8. $A = \begin{bmatrix} 4 & 5 \\ 5 & 6 \end{bmatrix}$

$f(x) = x^2 + \frac{7}{x}$

$\Rightarrow$ **f(A) = ?**

A) $\begin{bmatrix} 1 & 44 \\ 45 & 44 \end{bmatrix}$ B) $\begin{bmatrix} -1 & 85 \\ 84 & 86 \end{bmatrix}$ C) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

D) $\begin{bmatrix} -1 & 85 \\ 85 & 33 \end{bmatrix}$ E) $\begin{bmatrix} -5 & 65 \\ 65 & -5 \end{bmatrix}$

9. $z = \cos x + i\sin x$

$\Rightarrow \dfrac{z + |z|}{z - |z|} = ?$

A) $i \cdot \cot\dfrac{x}{2}$ B) $-i \cdot \tan\dfrac{x}{2}$ C) $i \cdot \tan\dfrac{x}{2}$

D) $-i \cdot \cot\dfrac{x}{2}$ E) $\tan\dfrac{x}{2}$

10. $0 < a < b$

$\Rightarrow \sqrt{-\log\dfrac{a}{b} \cdot \log\dfrac{b}{a}} + \log 5a - \log\dfrac{b}{2} = ?$

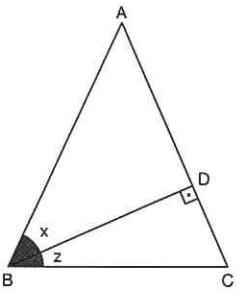
A) 1 B) 2 C) 3 D) 0 E) – 1

11. **$-x^2 - 4x + 16$ ifadesinin $-4 \le x \le 4$ için alabileceği en büyük ve en küçük değerleri arasındaki fark kaçtır?**

What is the difference between maximum and minimum values of $-x^2 - 4x + 16$ for $-4 \le x \le 4$?

A) 12 B) 18 C) 24 D) 30 E) 36

12.



$[AC] \perp [BD]$

$|AB| = |AC|$

$\sin z = \dfrac{1}{4}$

$\Rightarrow$ **sinx = ?**

A) $\dfrac{1}{8}$ B) $\dfrac{1}{4}$ C) $\dfrac{5}{8}$ D) $\dfrac{3}{4}$ E) $\dfrac{7}{8}$

13. P(2) = 2, P(3) = 6, P(4) = 12 şartlarını sağlayan polinomun derecesi 3, katsayılar toplamı ise 6 dır.

Buna göre, P(5) değeri kaçtır?

Values given above are satisfied by a polynomial of degree 3, if its sum of coefficients is 6.

What is the value of P(5) ?

A) 14 B) 17 C) 20 D) 22 E) 25

14. $0 < x, y, z < \dfrac{\pi}{2}$

$x + y + z = \pi$

$\Rightarrow \dfrac{\tan x - \tan x \tan y \tan z}{\tan y + \tan z} = ?$

A) 1 B) 2 C) – 1 D) – 2 E) 0

15. $f(x) = \int \frac{x}{2x+1}\,dx$

$f(0) = 0$

$\Rightarrow$ **f(4) = ?**

A) ln3 B) 2 + ln3 C) 2 D) 2 – ln3 E) 2ln3

16. $f(x + 2y) - f(x - 2y) = x^3y + y^4$

$\Rightarrow$ **f'(2) = ?**

A) 1 B) 2 C) 3 D) 4 E) 6

17. $f(x) = \frac{2}{x^2}\,\text{arccot}\left(\frac{1}{x^2}\right)$

fonksiyonu sürekli ise f(0) değeri kaçtır?

If the function f is continuous.

What is the value of f(0) ?

A) 1 B) $\frac{1}{2}$ C) 2 D) $\frac{1}{4}$ E) 4

18. $T(x) = \min\{1 - x,\ \sqrt{1 - x^2}\}$

$\Rightarrow \int_{-1}^{1} T(x)\,dx = ?$

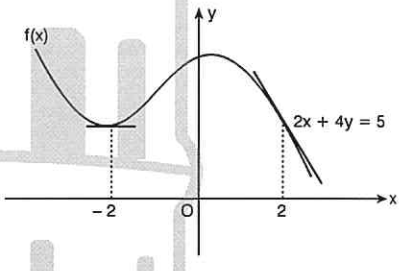
A) $\frac{\pi}{2}$ B) $\frac{\pi + 2}{4}$ C) $\frac{1}{2}$ D) $\frac{\pi - 2}{4}$ E) $\frac{\pi}{4}$

19. $f(x) = \prod_{k=0}^{25} (x - k)$

$\Rightarrow \left.\frac{df}{dx}\right|_{x=0} = ?$

A) 26! B) 25! C) 0 D) – 25! E) – 26!

20.



$\Rightarrow \int_{-2}^{2} \frac{f''(x)}{1 + f'(x)}\,dx = ?$

A) 1 B) – ln4 C) ln2 D) 0 E) – ln2

1-D 2-C 3-D 4-A 5-C 6-C 7-B 8-D 9-D 10-A 11-E 12-E 13-A 14-C 15-D 16-B 17-C 18-B 19-D 20-E