



ONDOKUZ MAYIS UNIVERSITY

2017

INTERNATIONAL STUDENT EXAM (OMÜ YÖS)



A



ONDOKUZ MAYIS UNIVERSITY  
INTERNATIONAL STUDENT EXAM

April 22, 2017

ENGLISH

NAME : .....

SURNAME : .....

ID NUMBER : .....

SIGNATURE : SEAT NUMBER: .....

IMPORTANT INFORMATION

1. This booklet includes test questions for international students who wish to study in certain Turkish universities.

The number of questions are as follows:

**Mathematics** 40  
**Basic Learning Skills** 40

2. This is an "A" type booklet. Please mark the type of your booklet on the answer sheet as shown below, and make sure it has been confirmed by the exam supervisor.  
**If you do not code the booklet type correctly on the answer sheet, your exam will be invalid.**

3. You have **120 minutes** to complete the exam.

4. Each question has only one correct answer. Multiple selections will be considered as incorrect.

5. The answers to the questions given in the booklet should be marked by pencil on the answer sheet provided with this booklet. Please use a pencil. Do not fold the answer sheet and do not write anything not required on it.

6. **Inappropriate markings on the answer sheet will not be read by the optical reader. The candidate is responsible for the mistakes incurred by inappropriate markings.**

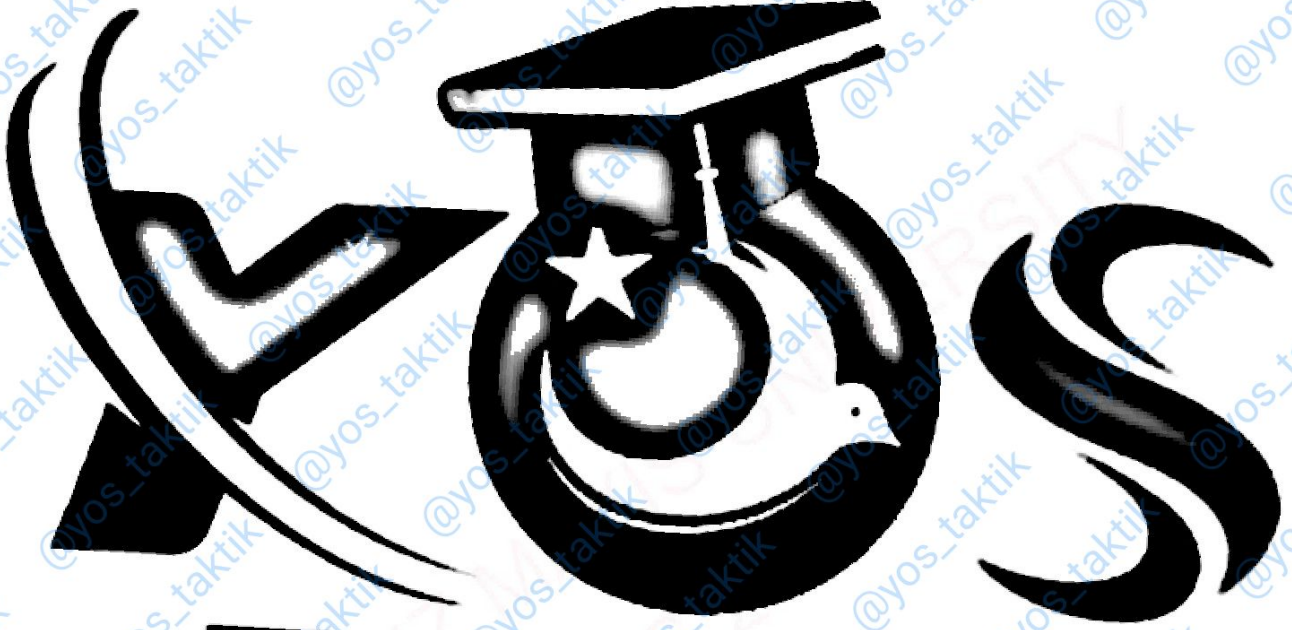
7. Only correct answers will be calculated in this exam. You will not lose any points for incorrect answers.

8. Further information about the examination rules are printed on the back cover of this booklet.

TYPE OF THE QUESTION BOOKLET

A ●	B ○
PARAPH	PARAPH

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**TAKTIK**  
**Türkiye ve Kıbrıs**



## MATHEMATICS

1.  $\frac{2,5}{0,25} + \frac{0,2}{0,02} = ?$

- A) 10      B) 11      C) 20      D) 100      E) 101

2. What is the sum of the values of  $a$  making

$$\frac{7}{3 - \frac{a}{a+4}}$$

undefined?

- A) -4      B) -6      C) -14  
D) -10      E) -5

3.  $3\sqrt{32} - \sqrt{27} + \sqrt{3} - \sqrt{2} = ?$

- A)  $2\sqrt{2} - 11\sqrt{3}$       B)  $2\sqrt{2} + \sqrt{3}$   
C)  $11\sqrt{2} - 2\sqrt{3}$       D)  $11\sqrt{2} - \sqrt{3}$   
E)  $11\sqrt{2} + \sqrt{3}$

4. If  $a - \frac{1}{b} = 5$ ,  $b - \frac{1}{a} = 15$  then, what is

$$\frac{a-b}{a} ?$$

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

5. Let  $x$  and  $y$  be two real numbers satisfying

$$\frac{1}{x-5} + \frac{1}{3-2y} = 0. \text{ What is } x - 2y?$$

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

6. If  $f(x) = \int \frac{x^3 + 8}{x^2 + 2x} dx$  and  $f(2) = 0$  then, what is  $f(1) = ?$

- A)  $\ln(2)$       B)  $4\ln(2)$       C) 0  
D)  $2 - 4\ln(2)$       E)  $\frac{1}{2} - 4\ln(2)$

7. Let  $A = \{a, b, 3, \{3\}, \square, \{3, \square\}, \{a\}\}$  and  
 $B = \{\{2\}, \Delta, a, \{b\}, 3, \square\}$

What is the total number of elements of  
 $A - B$  and  $A \cup B$ ?

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

8. Let  $a$  and  $b$  be the numbers of permutations of 4 persons around a flat and round table, respectively. What is  $a + b$ ?

- A) 8    B) 30    C) 48  
 D) 120    E) 144

9. Which one of the following functions is discontinuous at  $x = 1$ ?

A)  $f(x) = \begin{cases} x-1, & x \leq 1 \\ 1-x^2, & x > 1 \end{cases}$

B)  $f(x) = \sqrt{x+5}$

C)  $f(x) = \begin{cases} 3-x, & x < 1 \\ 2, & x = 1 \\ x^3-4, & x > 1 \end{cases}$

D)  $f(x) = \begin{cases} x^2, & x < 0 \\ 1, & x > 0 \end{cases}$

E)  $f(x) = \frac{1}{x^2-4}$

10. 5A1B is a four digit number divisible by 45. What is the sum of the possible values of A?

- A) 10    B) 12    C) 14  
 D) 16    E) 18

11.  $\left(\sin \frac{\pi}{6} + \cos \frac{\pi}{6}\right)^2 = ?$

- A) 0    B) 1    C)  $1 + \frac{1}{2}$   
 D)  $1 + \frac{\sqrt{3}}{2}$     E)  $1 + \sqrt{3}$

12.  $f(x) = e^{\cot x} \Rightarrow \lim_{x \rightarrow \frac{\pi}{4}} \frac{f(x) - f\left(\frac{\pi}{4}\right)}{x - \frac{\pi}{4}} = ?$

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



13. A league has 10 teams. A team plays with each of the other teams exactly once. How many matches took place?

- A) 5                      B) 20                      C) 45  
D) 55                      E) 60

14. Let  $f: \mathbb{R} \rightarrow \mathbb{R}$

$$f(x) = \begin{cases} x^2 - 1, & x < 4 \\ 3, & x = 4 \\ 2x + a, & x > 4 \end{cases}$$

For which  $a$  the function  $f$  has a limit at  $x = 4$ ?

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

15. How many integers  $x$  exist satisfying  $\log_3(\log_2(x-1)) \leq 1$ ?

- A) 8                      B) 7                      C) 9                      D) 10                      E) 5

16. The functions  $f$ ,  $g$  and  $h$  pass through the points  $A(2,1)$ ,  $B(1,3)$  and  $C(3,1)$  respectively.

If  $(hogof)(x) = x^3 - 2x + 2a$  then, what is  $a$ ?

- A) -3                      B)  $-\frac{3}{2}$                       C)  $-\frac{3}{4}$   
D) 0                      E)  $\frac{1}{2}$

17. If  $y = \frac{1}{x-5}$  then, what is

$$xy - 5y + 4 + x - \frac{1}{y} = ?$$

- A) 2                      B) 4                      C) 6                      D) 8                      E) 10

18.  $Z - |Z| = 2 - \sqrt{2}i \Rightarrow Z = ?$

- A)  $\frac{1}{2} - \sqrt{2}i$                       B)  $\frac{1}{2}i - \sqrt{2}$   
C)  $-\frac{1}{2} + \sqrt{2}i$                       D)  $i - \frac{\sqrt{2}}{2}$   
E)  $\sqrt{2} - \frac{1}{2}i$

19. What is the largest domain of the function

$$f(x) = \sqrt{5 - |x+2|} ?$$

- A)  $-2 \leq x \leq 5$   
 B)  $-2 < x < 5$   
 C)  $-7 < x < 7$   
 D)  $-7 \leq x \leq 3$   
 E)  $-3 \leq x \leq 3$

20. What is the sum of the integers  $x$  satisfying

$$4^{2 - \frac{x}{2}} \leq 1 \leq 3^{6-x} ?$$

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

21.  $\lim_{x \rightarrow 0} \frac{(\tan x)(\sqrt{x+2})}{\ln(x+1)} = ?$

- A)  $\sqrt{3}$     B)  $\sqrt{2}$     C) 0    D) 1    E) 2

22.  $\frac{\sin 10^\circ \cdot \cos 15^\circ + \sin 15^\circ \cdot \cos 10^\circ}{\cos 75^\circ \cdot \cos 10^\circ + \sin 75^\circ \cdot \sin 10^\circ} = ?$

- A) 0    B)  $\frac{1}{2}$     C)  $\frac{\sqrt{3}}{2}$     D) 1    E)  $\sqrt{3}$

23. For every real number  $x$  if

$$x^2 + ax - 7 = (x-1)(bx+c) \text{ then, what is } a+b+c?$$

- A) 14    B) -14    C) 7  
 D) 13    E) 15

24. Let  $x > 0$  and  $a = 5^x$ . What is  $\frac{25^{x+1} - 25}{5^{x+1} - 5}$

in terms of  $a$ ?

- A)  $3(a+1)$     B)  $5(a+1)$   
 C)  $3(a-1)$     D)  $-5(a+1)$   
 E)  $5(a-1)$



25.  $(9^a + 4)(3^a - 2)(3^a + 2) = 11 \Rightarrow a = ?$

A)  $\frac{1}{3}$

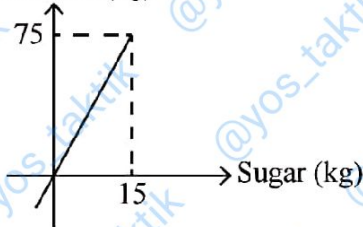
B)  $\frac{2}{3}$

C) 1

D)  $\frac{3}{4}$

E)  $\frac{1}{2}$

26. Mixture (kg)



The above figure shows the mixture of sugar-water and sugar in this mixture.

What is the water percentage in this mixture?

A) 20

B) 25

C) 50

D) 80

E) 85

27.  $f(x) = \int_2^{x^2+5} (2t+1) dt \Rightarrow f'(x) = ?$

A)  $6x^5 - 33x^2$

B)  $6x^5 + 33x^2$

C)  $6x^2 - 33x^5$

D)  $-6x^5 - 33x^2$

E)  $-6x^2 + 33x^5$

28. If  $a$  and  $b$  are non zero real numbers and

$$\frac{2a+b}{3} = \frac{b}{2} \text{ then, what is } \frac{2ab-b^2}{a^2+b^2} ?$$

A) 0

B)  $-\frac{8}{15}$

C)  $\frac{8}{5}$

D)  $\frac{24}{17}$

E)  $-\frac{8}{17}$

29. The length of a footstep of a man is 50 cm. If he walks 35 steps in a minute then, how many meters can he walk in an hour?

A) 500

B) 700

C) 1000

D) 1050

E) 2100

30. Let  $x$  be a positive even number. How many different positive integer values exist for

$$\frac{5x+140}{x} ?$$

A) 8

B) 9

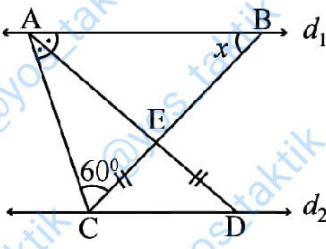
C) 7

D) 10

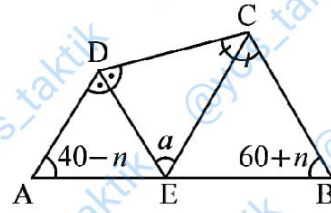
E) 6

31.  $\log_5(\log_2(3x-1))=1 \Rightarrow x=?$   
 A) 9      B) 10      C) 11      D) 12      E) 13

32. Let  $a$  and  $b$  be positive integers. If  $2a^2 - 3ab - 5b^2 = 0$  then, what is the minimum value of  $a+b$ ?  
 A) 8      B) 7      C) 6      D) 5      E) 4

33.   
 $d_1 \parallel d_2$   
 $m(\widehat{BAD}) = m(\widehat{CAD})$   
 $|EC| = |ED|$   
 $m(\widehat{ACB}) = 60^\circ$   
 $m(\widehat{ABC}) = x = ?$   
 A) 20      B) 25      C) 30  
 D) 35      E) 40

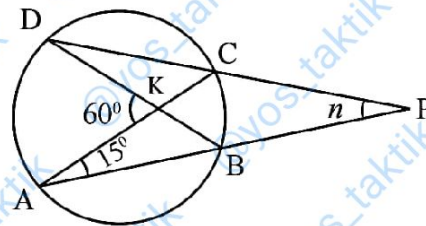
34.



ABCD quadrangle,  
 [DE], bisector  
 [CE], bisector  
 $m(\widehat{DAB}) = 40 - n$   
 $m(\widehat{ABC}) = 60 + n$   
 $m(\widehat{DEC}) = a = ?$

- A) 30      B) 40      C) 50  
 D) 60      E) 70

35.

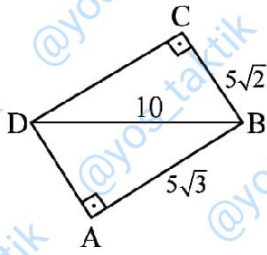


A, B, C, D on the circle  
 $m(\widehat{DKA}) = 60^\circ$   
 $m(\widehat{CAP}) = 15^\circ$   
 $m(\widehat{APD}) = n = ?$

- A) 10      B) 15      C) 20  
 D) 25      E) 30



36.



ABD and BCD right triangles

$$|AB| = 5\sqrt{3} \text{ cm}$$

$$|BC| = 5\sqrt{2} \text{ cm}$$

$$|DB| = 10 \text{ cm}$$

$$m(\widehat{ADC}) = ?$$

A) 105

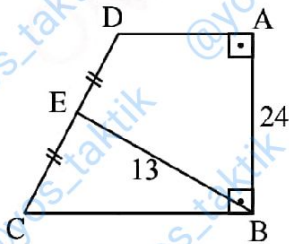
B) 110

C) 120

D) 125

E) 150

37.



ABCD trapezoid,  $[AD] \parallel [BC]$ ,  $[AB] \perp [BC]$ ,

$$|DE| = |EC|, |AB| = 24 \text{ cm}, |EB| = 13 \text{ cm}.$$

$$\text{Area}(ABCD) = ?$$

A) 100

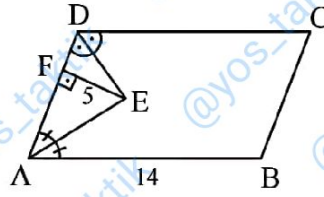
B) 120

C) 130

D) 140

E) 156

38.



ABCD parallelogram,  $[DE]$  and  $[AE]$  are bisectors,

$$[EF] \perp [AD], |EF| = 5 \text{ cm},$$

$$|AB| = 14 \text{ cm},$$

$$\text{Area}(ABCD) = ?$$

A) 35

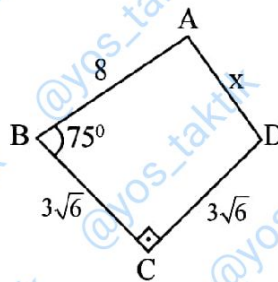
B) 70

C) 85

D) 105

E) 140

39.



ABCD quadrangle,  $[BC] \perp [CD]$

$$|AB| = 8 \text{ cm}$$

$$|BC| = |CD| = 3\sqrt{6} \text{ cm}$$

$$m(\widehat{ABC}) = 75^\circ$$

$$|AD| = x = ?$$

A) 10

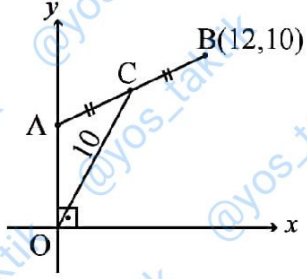
B)  $2\sqrt{13}$

C)  $2\sqrt{7}$

D)  $3\sqrt{7}$

E)  $2\sqrt{5}$

40.



$|AC| = |CB|$ ,  $|OC| = 10$  cm and  $B(12,10)$ .

What is the ordinate ( $y$ ) of the point A?

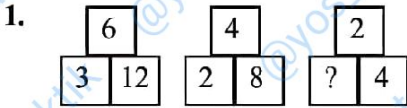
- A) 2    B) 3    C) 4    D) 5    E) 6

**Mathematics Test is completed.**





**BASIC LEARNING SKILLS**



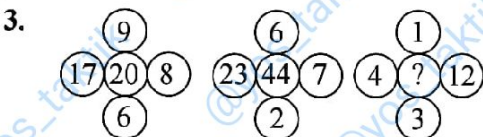
Which one of the following should be replaced in the question mark (?)?

- A) 1    B) 2    C) 4    D) 8    E) 16



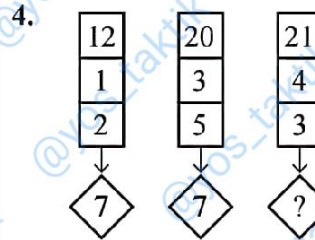
Which one of the following should be replaced in the question mark (?)?

- A)    B)   
 C)    D)   
 E)



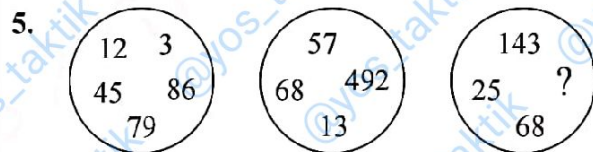
Which one of the following should be replaced in the question mark (?)?

- A) 12    B) 16    C) 24    D) 30    E) 36



Which one of the following should be replaced in the question mark (?)?

- A) 27    B) 5    C) 10    D) 11    E) 6



Which one of the following should be replaced in the question mark (?)?

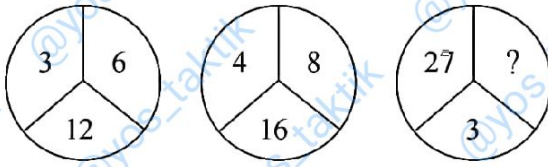
- A) 79    B) 96    C) 78  
 D) 13    E) 45



Which one of the following should be replaced in the question mark (?)?

- A) 11    B) 10    C) 9    D) 17    E) 19

7.



Which one of the following should be replaced in the question mark (?)?

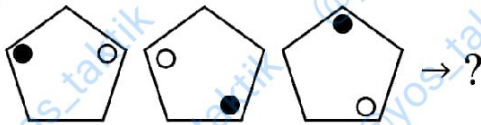
- A) 13    B) 22    C) 8    D) 16    E) 9

8. 1373 -----> 410,  
2847 -----> 912,  
6743 -----> ?

Which one of the following should be replaced in the question mark (?)?

- A) 1010    B) 911    C) 427  
D) 137    E) 713

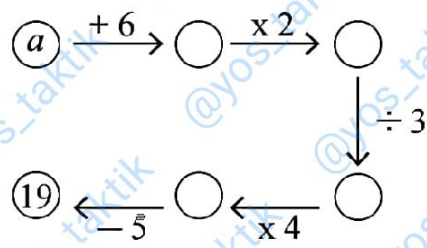
9.



Which one of the following should be replaced in the question mark (?)?

- A)    B)   
C)    D)   
E)

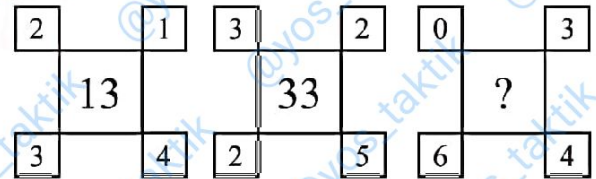
10.



$a = ?$

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

11.



Which one of the following should be replaced in the question mark (?)?

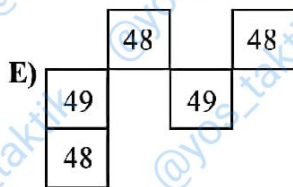
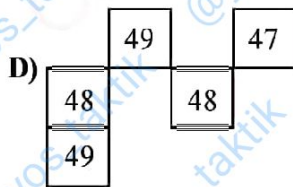
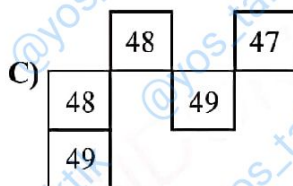
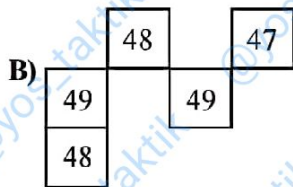
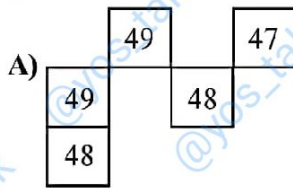
- A) 217    B) 18    C) 72  
D) 12    E) 65



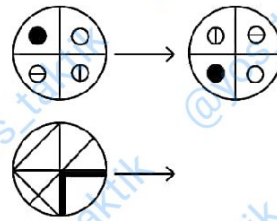
12.

50	51	49	52	48
46	47	45	48	44
49	50	?	51	?
47	?	46	?	45
48	?	47	50	46

Which one of the following should be replaced in the question mark (?)?



13.



Which one of the following should be replaced in the question mark (?)?



14.

$$\overrightarrow{ABCD} = ACBD, \quad \overleftarrow{ABCD} = DBCA$$

$$\overleftrightarrow{ABCD} = BADC$$

$$3\overleftarrow{A5D} + 3\overrightarrow{DA5} - \overleftrightarrow{A5D} = 7253$$

$$\Rightarrow A + D = ?$$

- A) 9      B) 10      C) 11      D) 12      E) 13

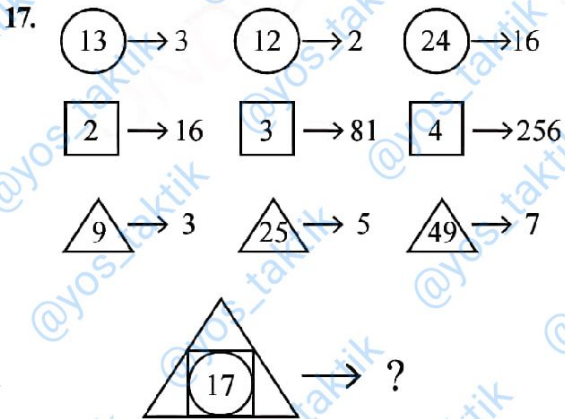
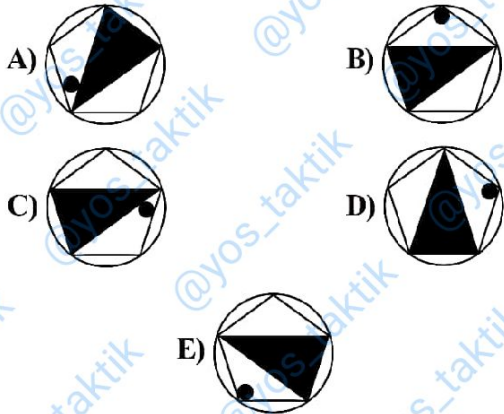
15. -1, 2, 14, ?, 254, 1022

Which one of the following should be replaced in the question mark (?)?

- A) 32      B) 48      C) 57      D) 62      E) 126

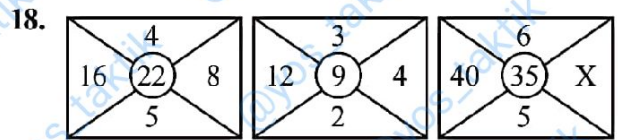


Which one of the following should be replaced in the question mark (?)?



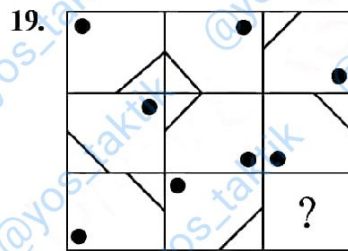
Which one of the following should be replaced in the question mark (?)?

- A) 100    B) 81    C) 49  
 D) 56    E) 25

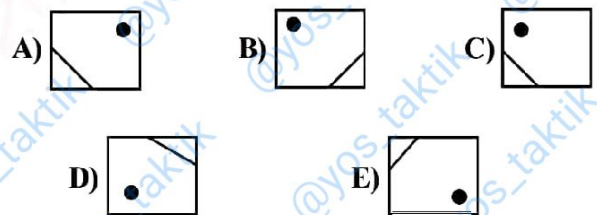


X = ?

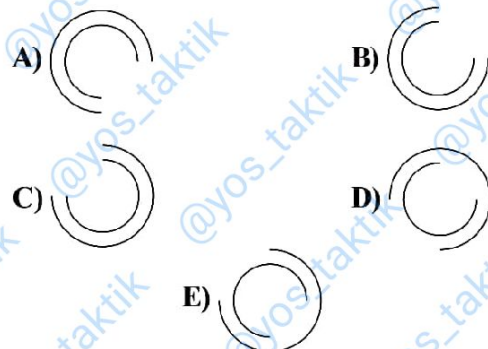
- A) 2    B) 4    C) 6    D) 8    E) 10



Which one of the following should be replaced in the question mark (?)?

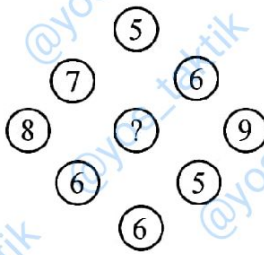


Which one of the following should be replaced in the question mark (?)?





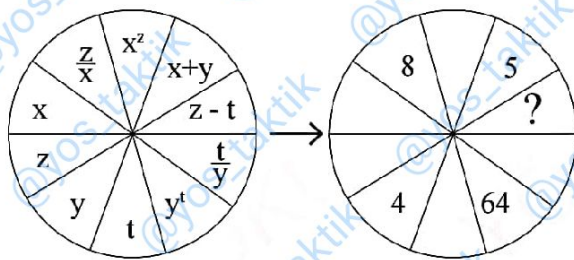
21.



Which one of the following should be replaced in the question mark (?)?

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

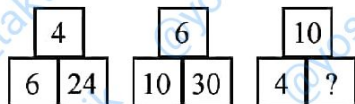
22.



Which one of the following should be replaced in the question mark (?)?

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

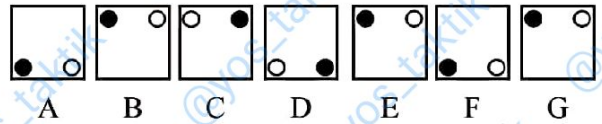
23.



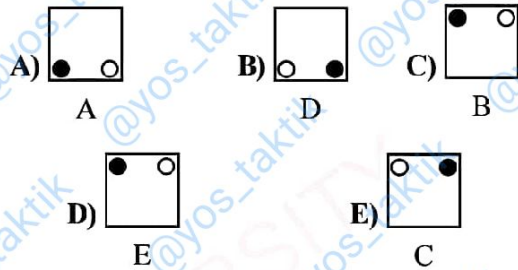
Which one of the following should be replaced in the question mark (?)?

- A) 24    B) 26    C) 28    D) 30    E) 32

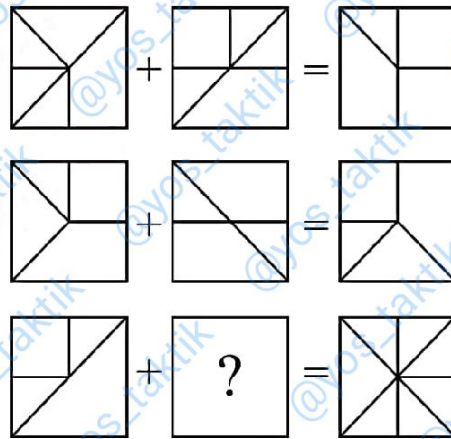
24.



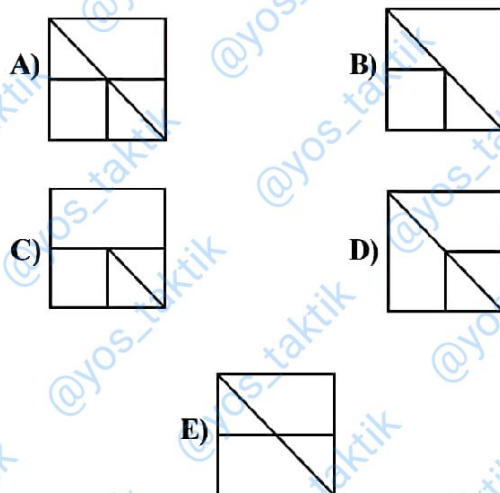
Which is the odd one out?



25.



Which one of the following should be replaced in the question mark (?)?



26.

7	5	6	4	?
9	3	8	2	?
2	7	1	6	?
4	5	3	4	?

Which one of the following should be replaced in the question mark (?)?

- A)  $\begin{pmatrix} 2 \\ 0 \\ 5 \\ 7 \end{pmatrix}$       B)  $\begin{pmatrix} 7 \\ 5 \\ 2 \\ 0 \end{pmatrix}$       C)  $\begin{pmatrix} 2 \\ 4 \\ 3 \\ 5 \end{pmatrix}$
- D)  $\begin{pmatrix} 7 \\ 5 \\ 3 \\ 5 \end{pmatrix}$       E)  $\begin{pmatrix} 5 \\ 7 \\ 0 \\ 2 \end{pmatrix}$

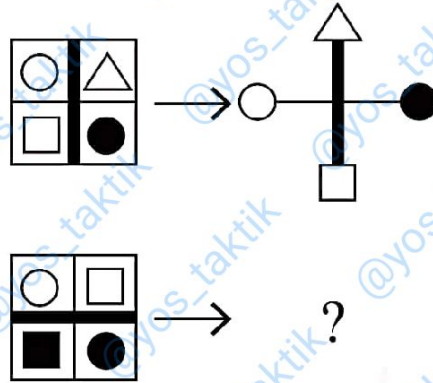
27.

4	→	45	→	11.3	→	41.3	→	x	→	y	→	25.9	→	33.9
---	---	----	---	------	---	------	---	---	---	---	---	------	---	------

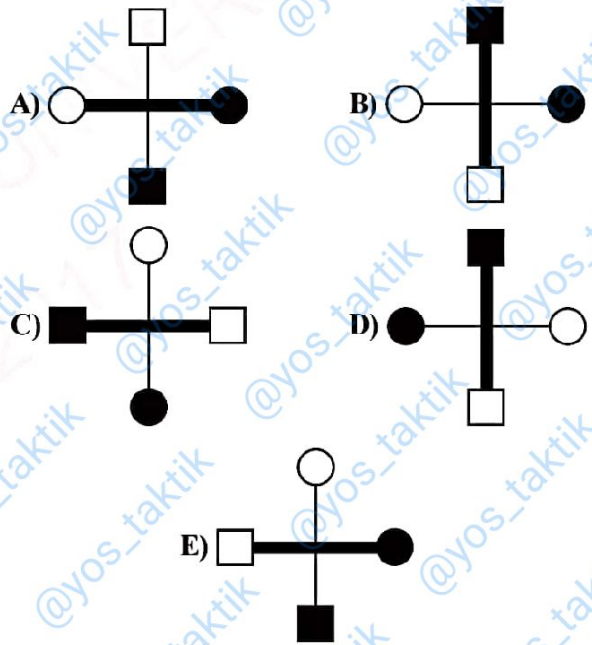
(x, y) = ?

- A) (7.6, 48.6)      B) (18.3, 37.3)
- C) (18.6, 37.6)      D) (7.3, 43.3)
- E) (3.7, 48.6)

28.

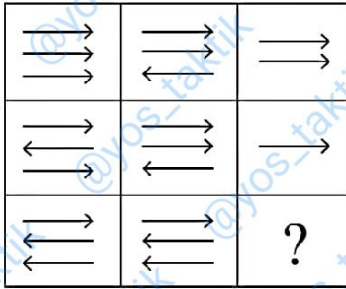


Which one of the following should be replaced in the question mark (?)?





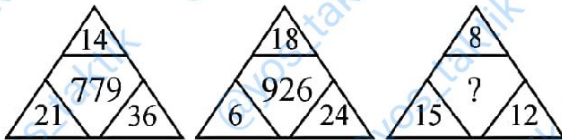
29.



Which one of the following should be replaced in the question mark (?)?

- A) ←  
←
- B) →  
←  
←
- C) ←
- D) →
- E) →  
←  
←

30.



Which one of the following should be replaced in the question mark (?)?

- A) 253      B) 356      C) 365
- D) 453      E) 465

31.



The clock in the figure shows 5:30.

How do the potential energies of hour hand and minute hand changes after 30 minutes?

- | <u>Hour hand</u> | <u>Minute hand</u> |
|------------------|--------------------|
| A) Increase      | Decrease           |
| B) Increase      | Increase           |
| C) Decrease      | Increase           |
| D) Decrease      | Decrease           |
| E) No change     | No change          |

32. A gas container has volume  $V$  and pressure  $P$ .

At a constant temperature what will be the volume of the container if the pressure is  $2P$ ?

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

33. Which one of the following is not inherited?

- A) Eye color      B) Hair color
- C) Blood type      D) Weight
- E) 6 finger

34. Which one of the following elements is a molecule?

- A)  $H$       B)  $He$       C)  $H_2$
- D)  $Li$       E)  $N$

35. A substance looks blue under white light. Which one of the following explains this situation?

- A) Substance absorbs the light
- B) Substance reflects the light
- C) Substance absorbs the blue light
- D) Substance reflects the blue light
- E) Substance absorbs the yellow light

36. Substances K, L, M are at equal weight and temperature. If they get equal heat energy then, their temperatures are related with  $T_K < T_L < T_M$

Which one of the following is exactly true?

- A) The specific heat capacity of K is smaller than that of M.
- B) The specific heat capacity of K is greater than that of M.
- C) The specific heat capacity of K is smaller than that of L.
- D) The specific heat capacity of M is greater than that of L.
- E) The specific heat capacities of K, L and M are equal.

37.  $H_2SO_4 + X \rightarrow Na_2SO_4 + 2H_2O$

What is X in the above reaction?

- A)  $Na_2O$
- B)  $NaOH$
- C)  $H_2O$
- D)  $2SO_4$
- E)  $2NaOH$

38. A car travels 450 kilometers in 5 hours. What is the average velocity of the car?

- A) 90 km/h
- B) 100 km/h
- C) 80 km/h
- D) 110 km/h
- E) 70 km/h

39. Which one of the following reactions is correct?

- A)  $H_2 + O_2 \rightarrow H_2O$
- B)  $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$
- C)  $Na + Cl_2 \rightarrow 2NaCl$
- D)  $2Mg + 3O_2 \rightarrow MgO$
- E)  $H_2SO_4 + NaOH \rightarrow Na_2SO_4 + H_2O$

40. If it rains in a sunny they then, rainbow forms at sky.

Which one of the following is wrong according to above data?

- A) White light is a combination of all other colors.
- B) Light breaks when it travels though two different mediums.
- C) Light with different colors break at different angles in a same medium.
- D) The speed of blue light is greater than that of red light.
- E) If light does not change place then, there is no breaking.