



# **Karadeniz Technical University**

## **Examination 2023**

تم تجميع هذه الأسئلة وكتابتها بغرض الاستفادة من نوع وأفكار أسئلة الجامعة،  
الملف قد يحتوي على بعض الأسئلة المشابهة وليست الأصلية وسيتم كتابة ذلك  
إلى جانب كل سؤال.

تمنياتي للجميع بالتوفيق ✨🌸

- Angel Yara

Question 1:

$$f: \mathbb{R} - \left\{\frac{8}{3}\right\} \rightarrow \mathbb{R} - \left\{\frac{1}{9}\right\}$$

$$f(x) = \frac{ax+5}{3x+b}$$

The function above is one to one and onto function, according to that:

$$b^a = ?$$

Question 2:

$$\frac{2^k}{\sqrt{4096}} - \frac{2}{\sqrt[k]{4096}} = 0$$

$$\max(k) = ?$$

Question 3:

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

$$P(1) = 3^n$$

$$P(2) = ?$$

### Question 4:

$a$  and  $b$  are real numbers

$$a \neq b$$

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

$$x = ?$$

### Question 5:

$$(4x - 2x^3 + 6)^6 = a_0 + a_1x + a_2x^2 + \cdots + a_{18}x^{18}$$

$$a_1 + a_2 + a_3 + \cdots + a_{17} = ?$$

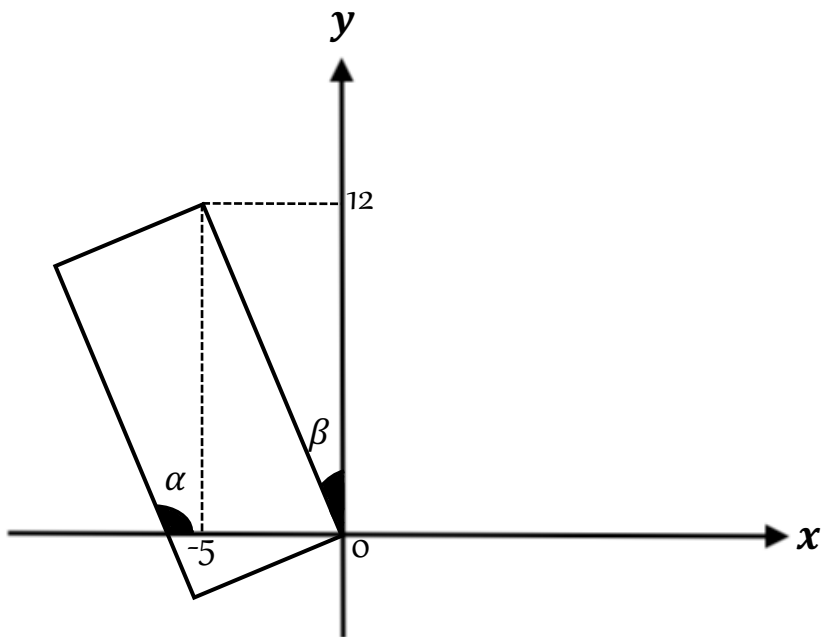
### Question 6:

$$\lim_{x \rightarrow 2} \frac{ax^2 + bx + c}{x^2 - 3x + 2} = -1$$

$$\lim_{x \rightarrow 3} \frac{ax^2 + bx + c}{x^2 - x - 6} = L$$

$$L = ?$$

### Question 7:



$$\cos \alpha + \cos \beta = ?$$

### Question 8:

$$a \neq 0 \text{ and } b \neq 0$$

$$A = \begin{bmatrix} a & 1 \\ 1 & 2 \end{bmatrix} \quad B = \begin{bmatrix} 0 & 2 \\ 3 & b \end{bmatrix}$$

$$(A + B)^2 = 16 \cdot I$$

$$a - b = ?$$

Question 9:

$$\frac{x^2 + x + a}{\left(1 + \frac{3}{x}\right) \left(\frac{2}{x} - 1\right)} = -x^2$$

$$a = ?$$

Question 10:

$$a \odot b = (a - 3)(b \odot a) - 2a + b$$

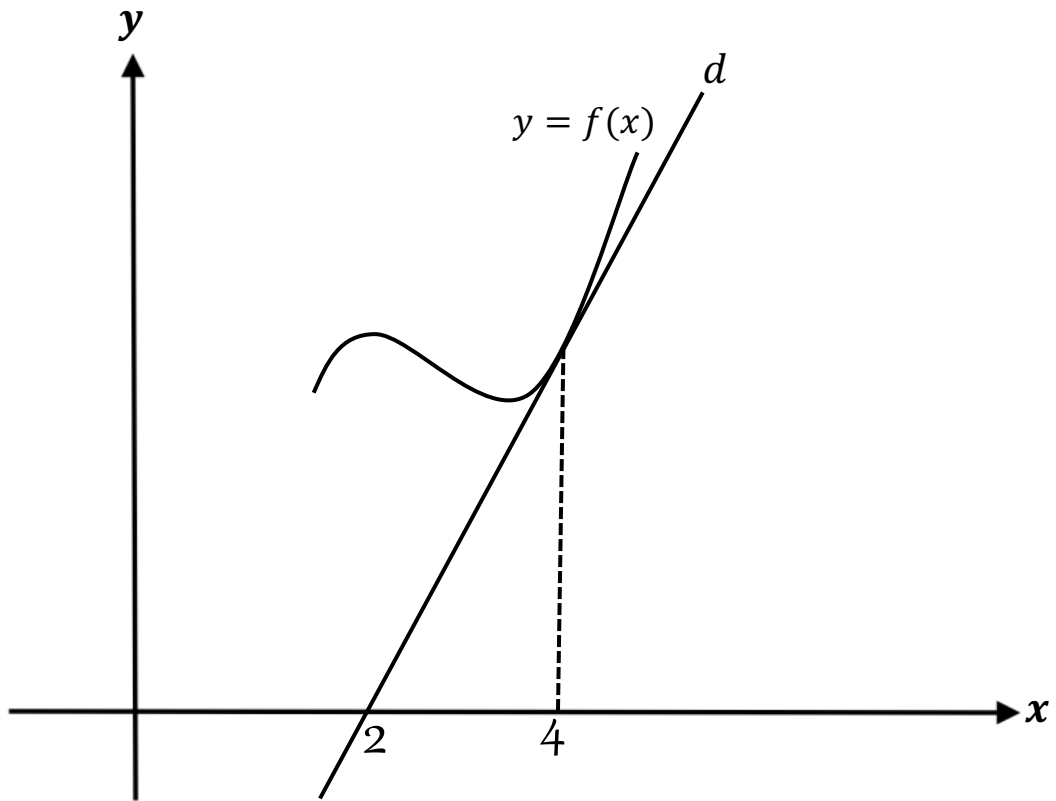
$$5 \odot 3 = ?$$

Question 11:

$$(a + b)^{17} - (a - b)^{15} = 3^{15} + 5^{17}$$

$$11a - 2b = ?$$

Question 12:



$$g(x) = \frac{f(x)}{x}$$

$$g'(4) = \frac{3}{8}$$

$$f(4) = ?$$

Question 13:

$$\frac{3^4 + 3^7 + 3^{10}}{3^{-4} + 3^{-7} + 3^{-10}} = ?$$

Question 14:

$$f(x) = \sqrt{x^2 + 3} \cdot g(x)$$

$$g(1) = 12$$

$$g'(1) = 5$$

$$f'(1) = ?$$

Question 15:

$$m \neq n, \quad m \cdot n \neq 0$$

$$m \cdot n = m + n$$

$$\frac{3^m + 3^n}{\sqrt[m]{3^n} + \sqrt[n]{3^m}} = ?$$



Question 16:

$$a < 0$$

$$\left| 2 - a + \sqrt{(a - 2)^2} \right| = 12$$

$$a^2 + a + 1 = ?$$

Question 17:

$$\lim_{x \rightarrow a} \frac{x \cdot f(x + 1) + 9}{x - a} = 10$$

$$f'(4) = ?$$

Question 18:

$$f \circ g(x) = 2x + 5$$

$$f \circ 2g(x) = x - 4$$

$$g^{-1} \circ f(1) = ?$$

Question 19:

$$\frac{z}{1+z} = 3 + 4i$$

$$|z| = ?$$

Question 20:

$$\frac{\cos 32 \sin 52}{\sin 26 \sin 58 \sin 32} = ?$$

Question 21:

$$(n-1)! \cdot (n-2)! = 900 \cdot (n-3)!$$

Question 22:

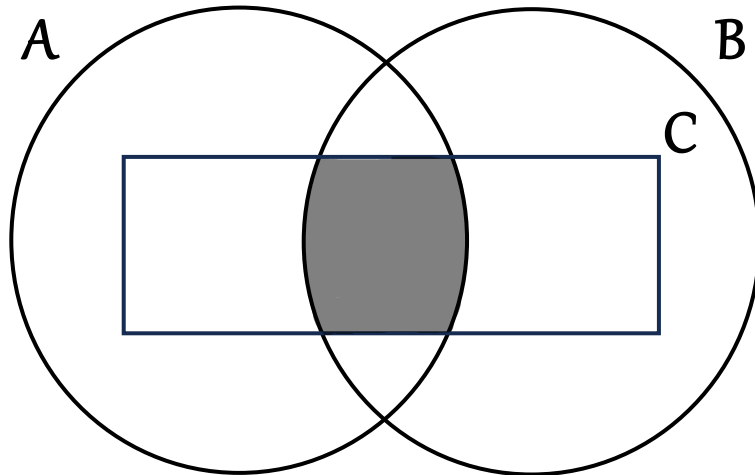
$$a = \sin 28$$

$$b = \cos 72$$

$$c = \tan 44$$

$$? < ? < ?$$

Question 23:



Which expression corresponds to the shaded region?

Answer:  $(A \cap B) - (A - C)$

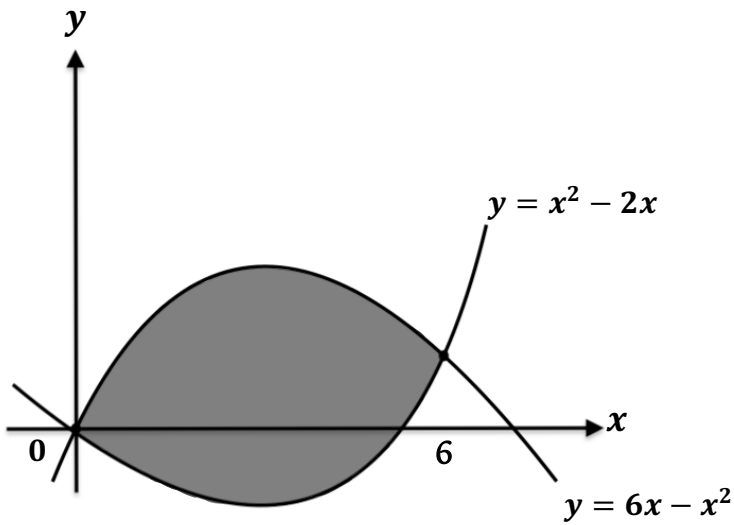
Question 24:

$$\frac{n(A - B)}{5} = \frac{n(A \cap B)}{3} = \frac{n(A \cup B)}{10}$$

$$n(B - A) = 8$$

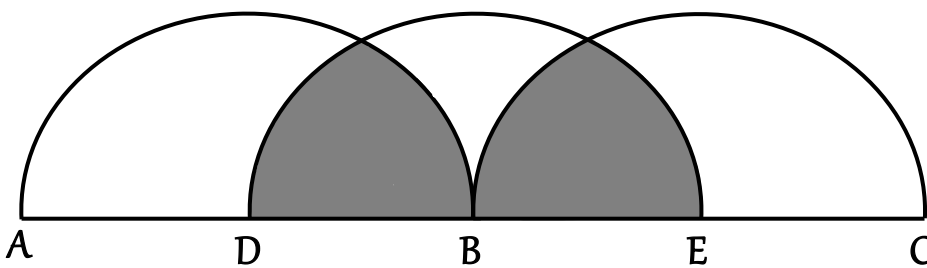
$$n(A) = ?$$

Question 25:



Shaded region/ Taralı Bölge =?

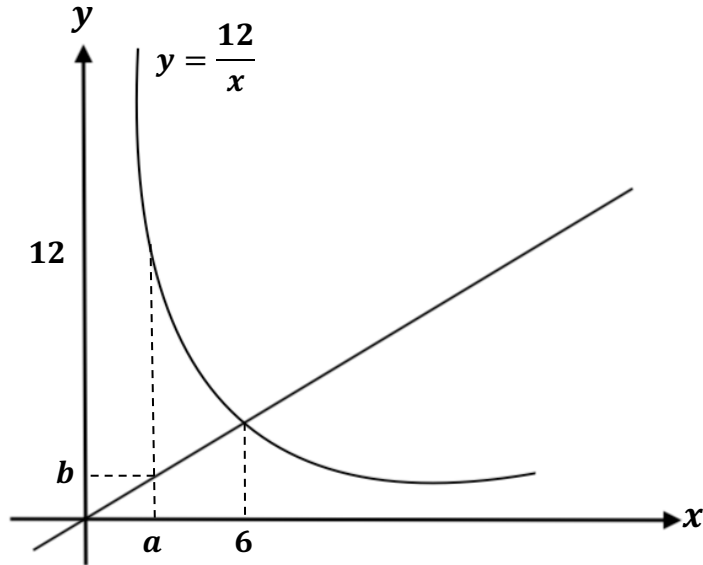
Question 26:



$$|AD| = |DB| = |BE| = |EC| = 2$$

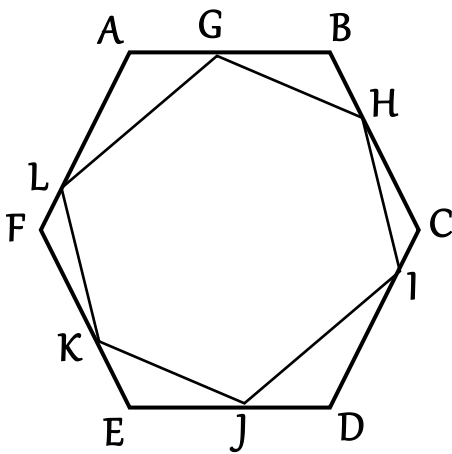
Shaded region/ Taralı Bölge =?

### Question 27:



$$4a + 3b = ?$$

### Question 28:



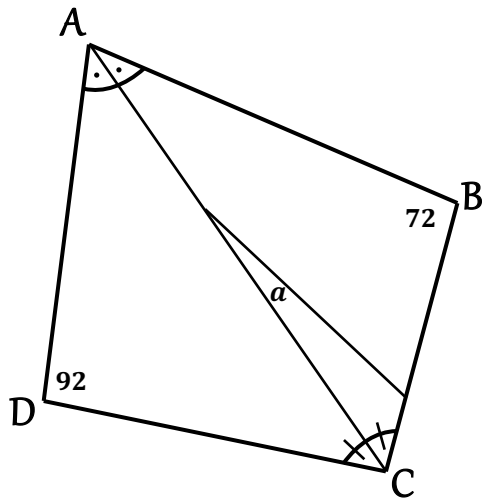
$ABCDEF$  and  $GHJKLM$  are hexagons

$ABCDEF$  ve  $GHJKLM$  altıgendir

$$|AG|=2 \quad |GB|=3$$

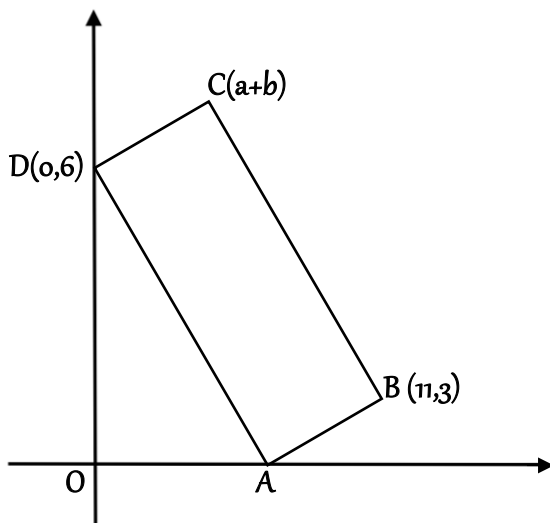
According to that / Buna göre,  $A(ABCDEF) - A(GHJKLM) = ?$

Question 29:



$a = ?$

Question 30:



ABCD is a rectangle/ ABCD dikdörtgen

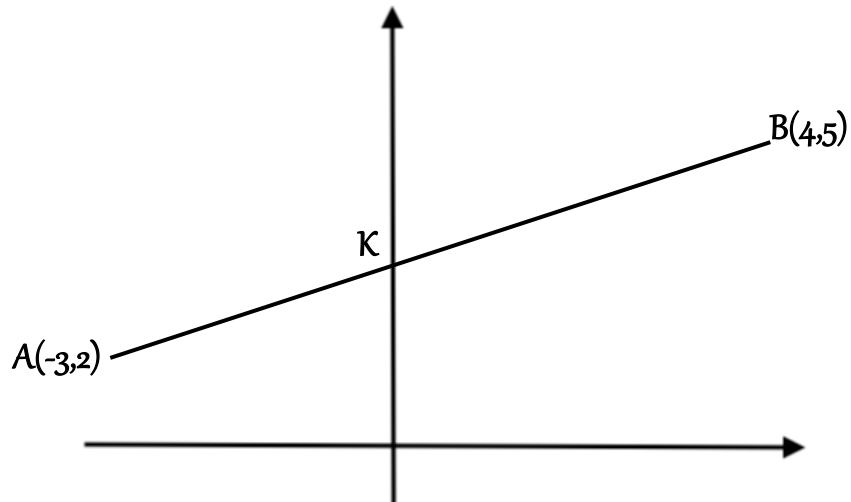
C(a+b)

B(n,3)

D(0,6)

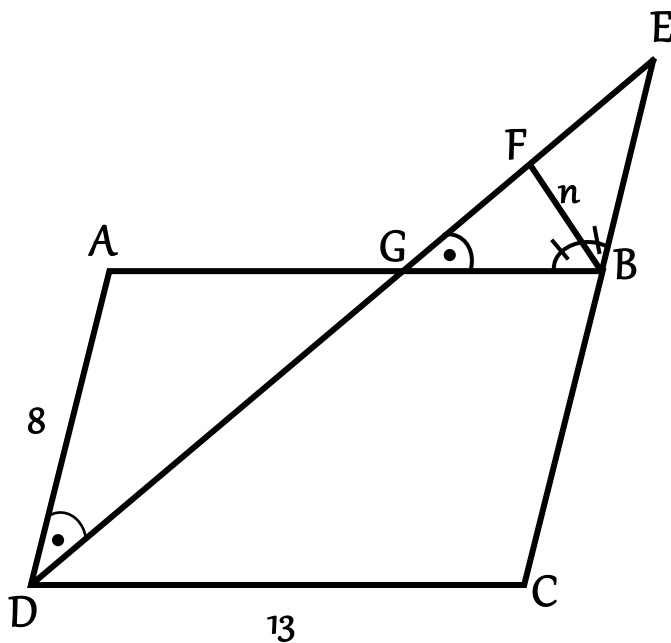
$\rightarrow a + b = ?$

Question 31:



$K=?$

Question 32:



ABCD is a parallelogram.

ABCD Parallelenar.

$$|AD|=8$$

$$|DC|=13$$

$$|BF|=n$$

$$n=?$$

### Question 33: (Benzer Soru)

1	2	3	4	5
		1		
X		4		
		2		
		5		

A 5x5 square must be filled in with numbers from 1-5 with no repeated numbers in every column, row and diameter.

According to that, X=?

### Question 34: (Benzer Soru)

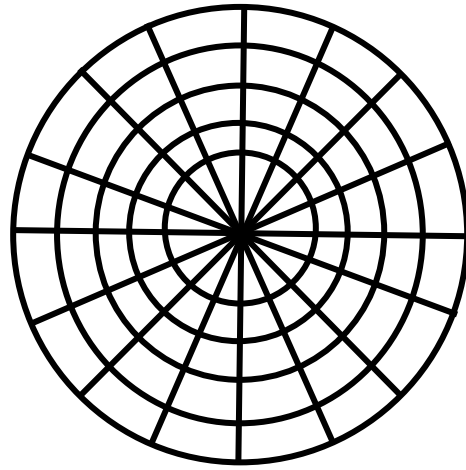


Which letter can be formed by combining these parts together?

- A) Y    B) A    C) X    D) W    E) M



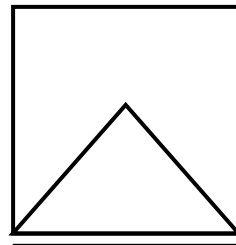
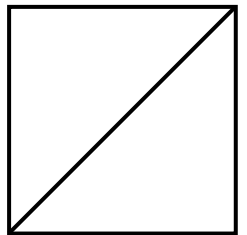
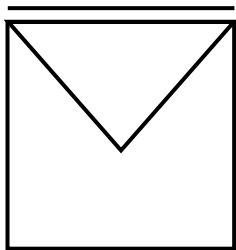
Question 35:



How many radiuses are in the figure above?

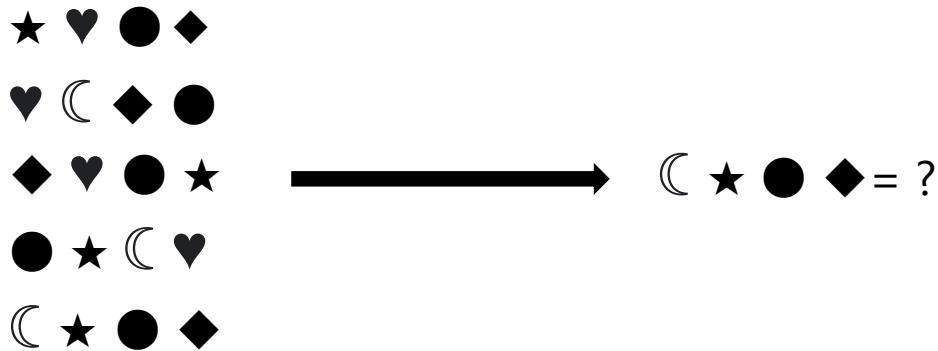
Answer: 80

Question 36:



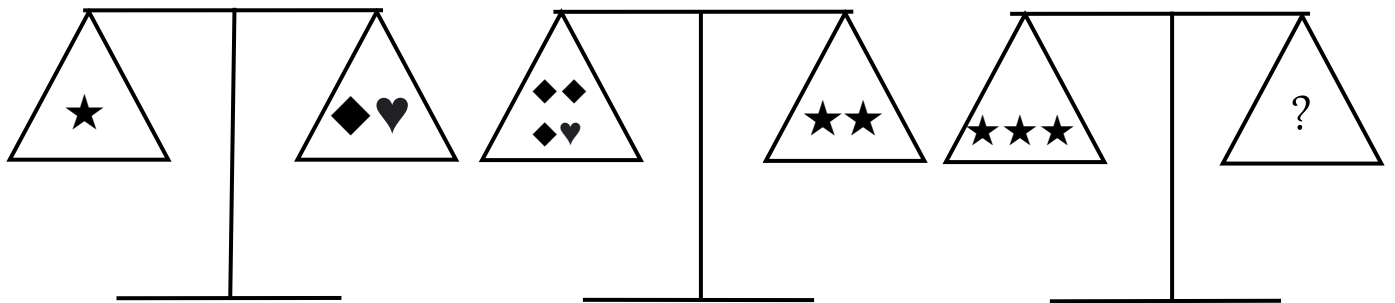
?

### Question 37: (Benzer Soru)



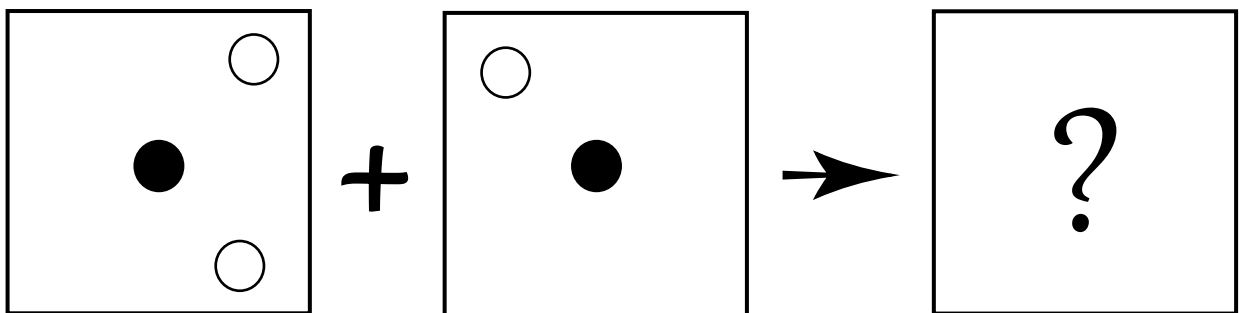
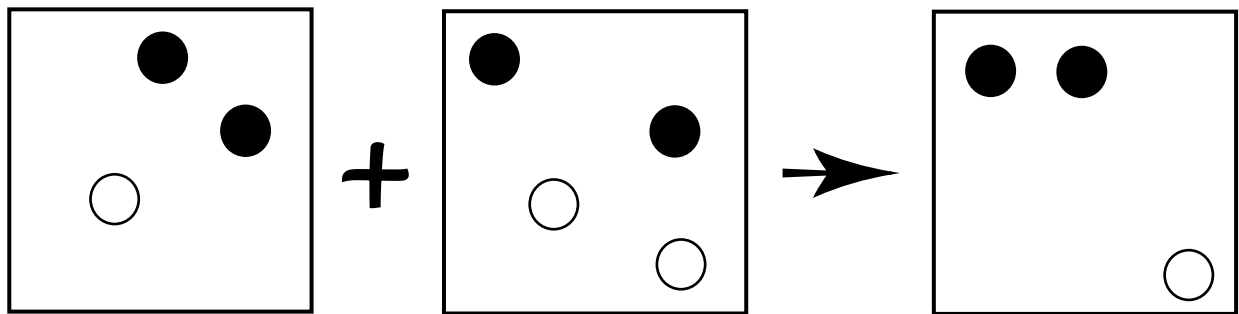
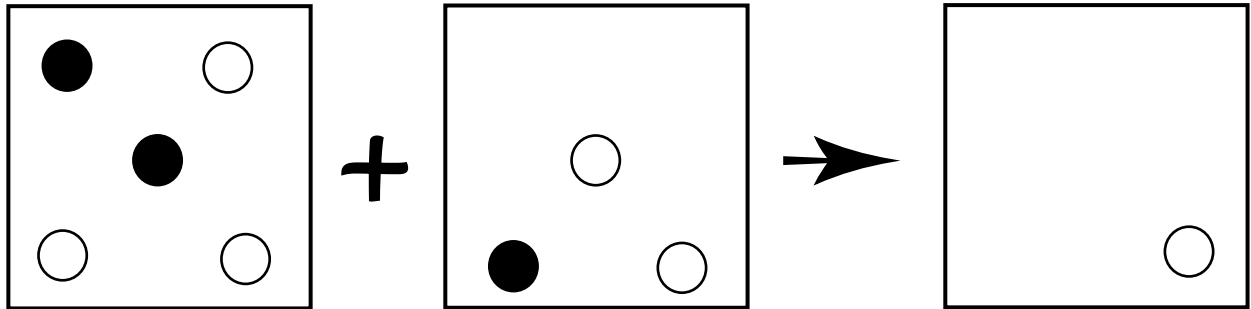
- A)9531    B)1539    C)3185    D)8139    E)5893

### Question 38:

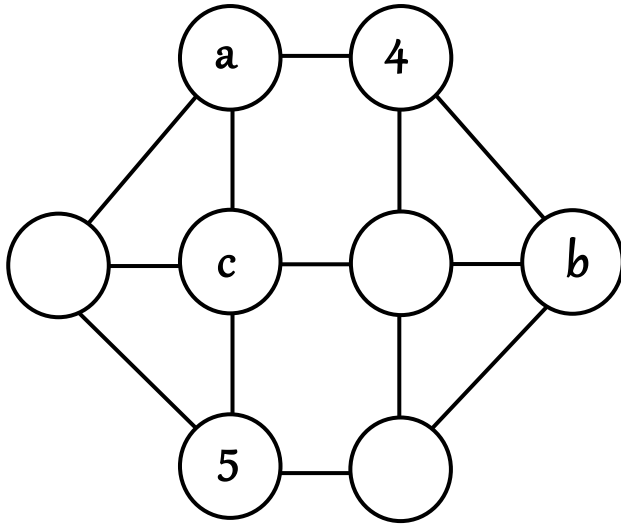


Answer: ♥ ♥ ♥ ♥ ◆ ◆

Question 39: (Benzar Soru)



Question 40:



Numbers (1,2,3,4,5,6,7,8) are used once in these circles, on the condition that every 2/3/4 connected circle shouldn't have consecutive numbers.

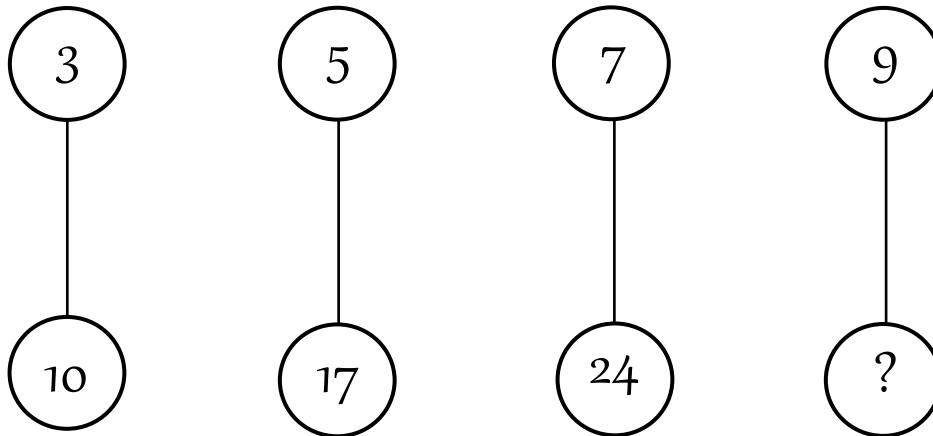
According to that,  $a+b+c = ?$

Question 41:

		?

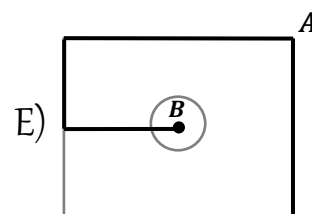
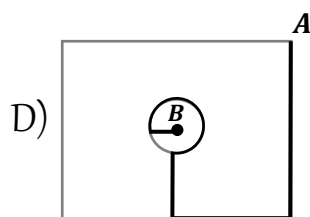
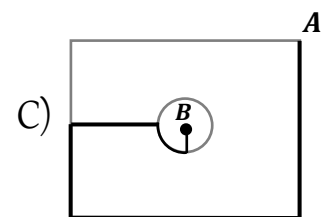
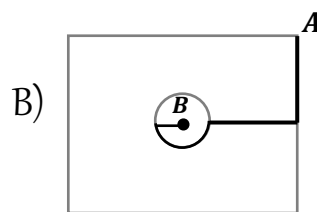
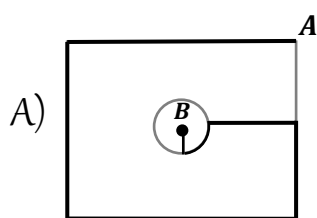
Answer:

Question 42:



Question 43: (KTÜ 2022 Benzar Soru)

Which of the following is the shortest way from A to B?



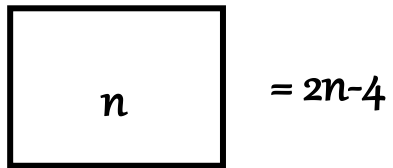
Question 44: (Benzar Soru)

	A	B	C	D
1	○☆✓✱	○✱✓△	☆○✓△	△☆✱✓
2	✱☆✓△	✱☆✱△	✱☆✓△	✱☆✓✱
3	○✱✱✓	✱☆✱✓	✱☆✓✱	○☆✓△
4	○✱✓✱	○☆✱△	○☆✓△	△✓○✱

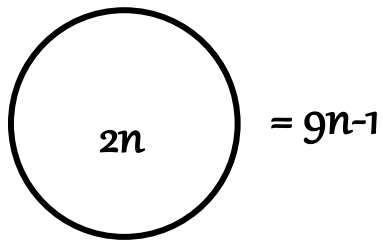
Which of the following boxes is similar to B<sub>1</sub>?

- A) C<sub>2</sub>    B) A<sub>3</sub>    C) D<sub>4</sub>    D) D<sub>1</sub>    E) B<sub>2</sub>

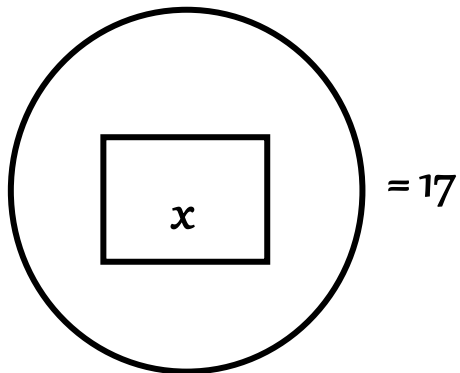
Question 45: (Benzar Soru)



$= 2n - 4$



$= 9n - 1$

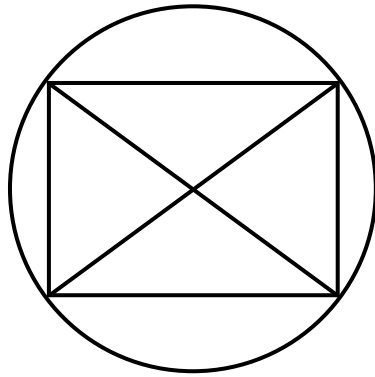


$= 17$

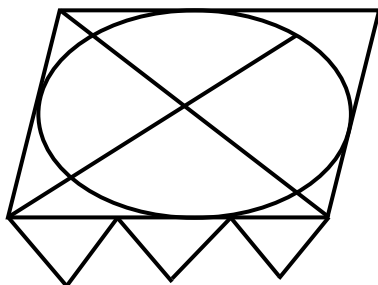
$X = ?$

Question 46: (Benzar Soru)

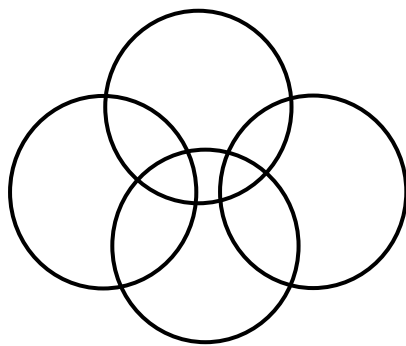
I.



II.



III.



Which of these 3 figures can be drawn without:

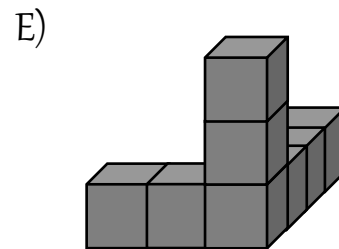
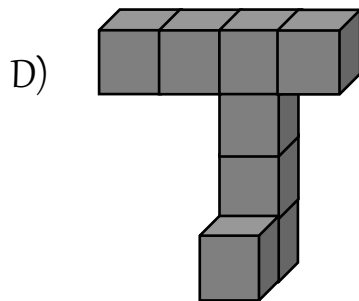
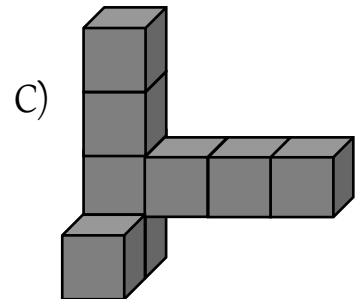
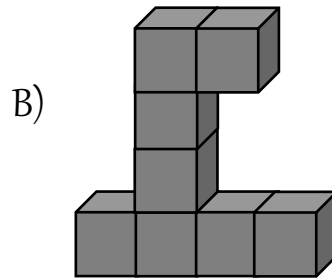
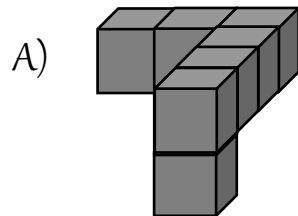
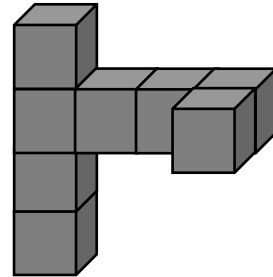
- lifting the pencil
- Going back on the same line

Note: (There might be more than one choice)

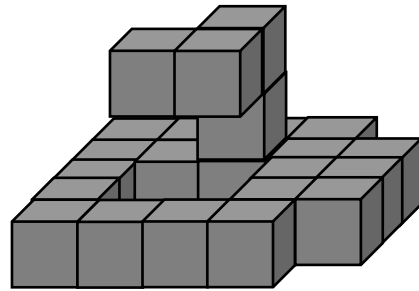


Question 47:

Which of the following is similar to this figure?

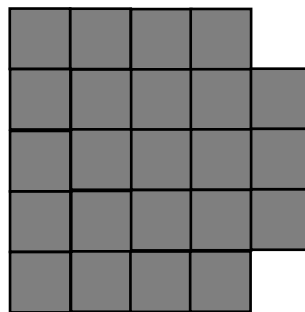


Question 48:



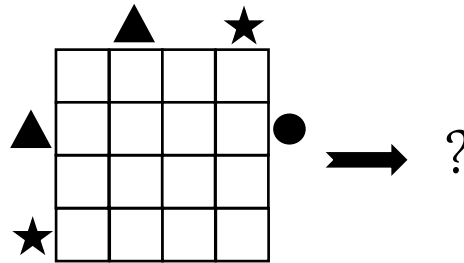
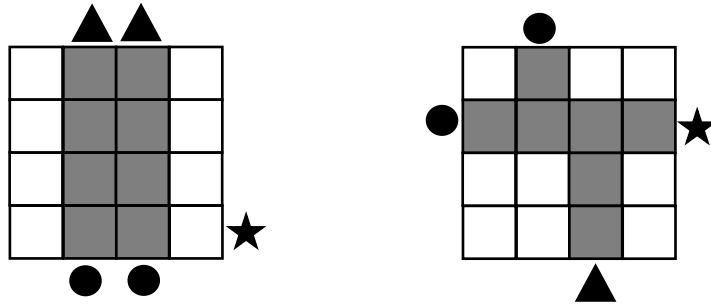
Which of the following is the view of the object from up?

Answer:

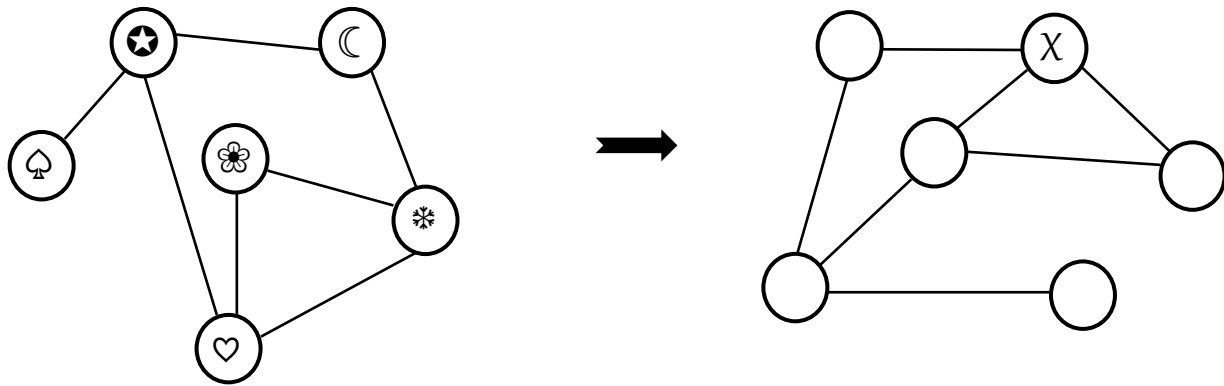


### Question 49: (KTÜ 2022 Benzar Soru)

Örnek:



### Question 50: (Benzar Soru)



$\chi = ?$