

$$\begin{aligned}
 1. \quad a \triangle b &= a + b + 4ab \\
 3 \triangle x &= 3 + x + 4.3.x = 42 \\
 3 + x + 12x &= 42 \\
 13x &= 39 \\
 x &= 3
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 2. \quad a \star b &= a^b - b \\
 3 \star 2 &= 3^2 - 2 = 7 \\
 (3 \star 2) \star x &= 6 \Rightarrow 7 \star x = 6 \\
 7 \star x &= 7^x - x = 6 \Rightarrow x = 1 \text{ dir.}
 \end{aligned}$$

Cevap: B

$$\begin{aligned}
 3. \quad 4 \triangle 2 &= 4^y - 4^2 = 16 - 8 = 8 \\
 a \star 5 &= a - 5 + 1 = a - 4 \\
 \Rightarrow a - 4 &= 8 \Rightarrow a = 12
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 4. \quad a \star b &= a^{b+2} + a.b \\
 2 \star -1 &= 2^{-1+2} + 2.(-1) = 2 - 2 = 0 \\
 1 \star -2 &= 1^{-2+2} + 1.(-2) = 1 - 2 = -1 \\
 \Rightarrow (2 \star -1) \triangle (1 \star -2) &= 0 \triangle -1 \\
 \Rightarrow 0 \triangle -1 &= 0 + (-1)^0 = 1
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 5. \quad x \star 1 &= 2x + 3 \\
 2 \triangle (x \star 1) &= 2 \triangle (2x + 3) \\
 2 \triangle (2x + 3) &= 4 \cdot 2 \cdot (2x + 3) = 104 \\
 2x + 3 &= 13 \\
 2x &= 10 \\
 x &= 5
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 6. \quad 7 \star 2 &= 2.7 - 2 && (7 > 2) \\
 &= 12 \\
 2 \star 3 &= 2 + 2.3 && (2 - 3 < 0) \\
 &= 8 \\
 \Rightarrow (7 \star 2) \triangle (2 \star 3) &= 12 \triangle 8 \\
 12 \triangle 8 &= 4.12 - 8^2 + 40 = 48 - 64 + 40 \\
 &= 24
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 7. \quad (4, x) \triangle (1, 2) &= (4.2, (x+1).1) = (8, x+1) \\
 (x, 2) \triangle (3, y) &= (x.y, (2+1).3) = (x.y, 9) \\
 (8, x+1) &= (x.y, 9) \\
 \Rightarrow x+1 &= 9 \text{ ve } x = 8 \\
 x.y = 8 &\Rightarrow 8.y = 8 \text{ ve } y = 1
 \end{aligned}$$

Cevap: E

$$8. \bullet \quad 3 \star \frac{1}{4} = 3 - \frac{1}{2 \cdot \frac{1}{4}} = 3 - \frac{1}{\frac{1}{2}} = 3 - 2 = 1$$

$$\Rightarrow m \triangle \left(3 \star \frac{1}{4}\right) = m \triangle 1 = \frac{4}{5}$$

$$m \triangle = 1 = \frac{m+1}{m \star 1} = \frac{m+1}{m - \frac{1}{2 \cdot 1}} = \frac{4}{5}$$

$$= \frac{m+1}{m - \frac{1}{2}} \times \frac{4}{5}$$

$$5m + 5 = 4m - 4 \cdot \frac{1}{2}$$

$$5m + 5 = 4m - 2$$

$$m = -7$$

Cevap: A

$$9. \quad \underbrace{(2 \star m) \star 3}_1 = 1$$

(2 ★ m ve 3 den minimum olanı 1 ise
2 ★ m = 1 olmalı.

$$\Rightarrow 2 \star m = 1$$

2 ve m den minimum olanı ise
m = 1'dir.

Cevap: A

$$10. \quad 10 \triangle 15 = \text{OBEB}(10, 15) = 5 \quad (a \leq b)$$

$$30 \triangle (10 \triangle 15) = 30 \triangle 5 = \text{EKOK}(30, 5) = 30 (a > b)$$

Cevap: E

$$11. \bullet \quad x = 2 \text{ ve } y = 2 \text{ için } x = y \Rightarrow 2 \square 2 = 2 \cdot 2 + 5 = 9$$

$$\Rightarrow (2 \square 2) \square 10 = 9 \square 10 = 4 \cdot 9 - 2 \cdot 10 = 36 - 20 = 16 \text{ olur.}$$

↓

$$\left(\begin{array}{l} x = 9 \text{ ve } y = 10 \\ x < y \end{array} \right)$$

Cevap: D

TASARI EĞİTİM YAYINLARI

12.

$$a \triangle b = \begin{cases} b & , \quad b \text{ tek ise} \\ a & , \quad b \text{ çift ise} \end{cases}$$

$$(x \triangle 1) + (x \triangle 2) + (x \triangle 3) + (x \triangle 4) = 24$$

$$\begin{array}{cccc} \downarrow & \downarrow & \downarrow & \downarrow \\ b \text{ tek} & b \text{ çift} & b \text{ tek} & b \text{ çift} \end{array}$$

$$1 + x + 3 + x = 24$$

$$2x + 4 = 24$$

$$2x = 20$$

$$x = 10 \text{ olur.}$$

Cevap: A

$$1. a \star b = a^{\frac{1}{2}}(a-21) + b^{\frac{1}{2}}(b-22)$$

$$27 \star 48 = 3\sqrt{3} \cdot 6 + 4\sqrt{3} \cdot 26 \\ = 18\sqrt{3} + 104\sqrt{3} = \boxed{122\sqrt{3}}$$

Cevap: D

$$2. \cdot 24 \odot 36 = \text{obeb}(24, 36) = 12 \\ \Rightarrow (24 \odot 36) \otimes x = 48$$

$$12 \otimes x = 48$$

$$\text{okek}(12, x) = 48$$

$$\text{okek}(2^2 \cdot 3, x) = 2^4 \cdot 3$$

↳ x en az 16 olabilir.

Cevap: B

$$3. \frac{y-x}{x \triangle y} = \frac{1}{x \cdot y} \Rightarrow x \triangle y = x \cdot y (y-x)$$

$$4 \triangle 6 = ? \quad 4 \triangle 6 = 4 \cdot 6 (6-4) \\ = 24 \cdot 2 \\ = 48$$

Cevap: C

$$4. a \star b = a(a+b)$$

$$x \star (1 \star (1 \star 1)) = 28$$

$$1 \star 1 = 1(1+1) = 2$$

$$1 \star 2 = 1(1+2) = 3$$

$$x \star 3 = 28$$

$$x(x+3) = 28$$

$$x = 4$$

Cevap: D

$$5. 2 \odot 3 = 2(3 \odot 2) + 2$$

$$3 \odot 2 = 2(2 \odot 3) + 3$$

2. denklem 2 ile çarpılıp taraf tarafa toplanır

$$2 \odot 3 + 2(3 \odot 2) = 2(3 \odot 2) + 2 + 4(2 \odot 3) + 6$$

$$2 \odot 3 = 4(2 \odot 3) + 8$$

$$3(2 \odot 3) = -8$$

$$2 \odot 3 = -\frac{8}{3}$$

Cevap: E

$$6. \left(\frac{1}{4} \star \frac{1}{3}\right) = \frac{\frac{1}{3} \cdot \frac{1}{4}}{\frac{1}{4}} = \frac{1}{3}$$

$$\left(\frac{1}{3} \star \frac{1}{5}\right) = \frac{\frac{1}{5} \cdot \frac{1}{3}}{\frac{1}{5}} = \frac{2}{3}$$

Cevap: B

$$7. \frac{2(x+2y)-2x+y}{x+2y+2x-y} = \frac{1}{2}$$

$$\frac{5y}{3x+y} = \frac{1}{2} \Rightarrow 10y = 3x+y$$

$$9y = 3x$$

$$\frac{x}{y} = 3$$

Cevap: E

8. $x = 2$ ve $y = \frac{1}{3}$ için;

$$\left(2\triangle\frac{1}{3}\right) + 2 \cdot \left(\frac{1}{3}\triangle\frac{1}{2}\right) = \frac{2}{3}$$

$$\left(2\triangle\frac{1}{3}\right) + 2 \cdot \left(3\triangle\frac{1}{2}\right) = 6 \dots\dots\dots \text{I}$$

$x = 3$ ve $y = \frac{1}{2}$ için

$$\left(3\triangle\frac{1}{2}\right) + 2 \cdot \left(\frac{1}{2}\triangle\frac{1}{3}\right) = \frac{3}{2}$$

$$\left(3\triangle\frac{1}{2}\right) + 2 \cdot \left(2\triangle\frac{1}{3}\right) = 6 \dots\dots\dots \text{II}$$

II. denklem (-2) ile çarpılıp I denklem ile toplanır;

$$-3 \cdot \left(2\triangle\frac{1}{3}\right) = -6$$

$$2\triangle\frac{1}{3} = 2$$

Cevap: B

9. $\frac{(a+2)!}{(a+1+1)!} = \frac{(a+1)!}{(a+2)!} = \frac{(a+1)!}{(a+2) \cdot (a+1)!} = \frac{1}{a+2}$

$$\frac{(a+1-1)!}{(a+1)!} = \frac{a!}{(a+1)!} = \frac{a!}{(a+1) \cdot a!} = \frac{1}{a+1}$$

$$\frac{1}{a+2} \cdot \frac{1}{a+1} = \frac{1}{20}$$

$$\underbrace{(a+2)}_5 \cdot \underbrace{(a+1)}_4 = 20$$

$$\boxed{a = 3}$$

Cevap: D

10. $\left(4 \odot \frac{1}{x}\right) = \left(x \odot \frac{4}{x}\right)$

$$4 \cdot \frac{1}{x} + 2 \cdot 4 + 2 \cdot \frac{1}{x} = x \cdot \frac{4}{x} + 2 \cdot x + 2 \cdot \frac{4}{x}$$

$$\frac{4}{x} + 8 + \frac{2}{x} = 4 + 2x + \frac{8}{x}$$

$$8 + \frac{6}{x} = 4 + 2x + \frac{8}{x}$$

$$0 = \frac{2x}{(x)} + \frac{2}{x} - \frac{4}{(x)}$$

$$0 = \frac{2x^2 + 2 - 4x}{x}$$

$$0 = 2x^2 - 4x + 2$$

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

$$0 = (x - 1)^2$$

$$0 = x - 1$$

$$-1, 1 = x \quad \text{Pozitif tanımlı olduğundan}$$

$$x = 1$$

Cevap: B

11. $a \oplus b = a \cdot (a+b)^2 - 11$

$$(k+2) \oplus (3-k) = (k+2) \cdot (k+2+3-k)^2 - 11 = 79$$

$$(k+2) \cdot 25 = 90$$

$$k+2 = \frac{18}{25} \Rightarrow \boxed{k = \frac{8}{5}}$$

Cevap: D

12. $x \odot y = x^2 + y^2$ ve $a + b = 8$ olduğundan

$$5 \odot a = b \odot 7$$

$$5^2 + a^2 = b^2 + 7^2$$

$$a^2 - b^2 = 49 - 25$$

$$(a-b) \underbrace{(a+b)}_8 = 24$$

$a - b = 3$ bulunur.

Cevap: B

7. $x \triangle e = x$ ($e =$ Etkisiz Eleman)

$x \triangle x^{-1} = e$ ($x^{-1} = x$ 'in tersi)

• $x \triangle e = 3xe - 3x - 3e + 4 = x$

$3xe - 3e = 4x - 4$

$3e(x-1) = 4(x-1)$

$3e = 4$

$e = \frac{4}{3}$

• $2 \triangle 2^{-1} = e = \frac{4}{3}$ ($2^{-1} = a$ olsun)

$2 \triangle a = \frac{4}{3}$

$2 \triangle a = 3 \cdot 2 \cdot a - 3 \cdot 2 - 3 \cdot a + 4 = \frac{4}{3}$

$6a - 6 - 3a + 4 = \frac{4}{3}$

$3a - 2 = \frac{4}{3}$

$3a = \frac{4}{3} + 2 \Rightarrow 3a = \frac{10}{3}$

$a = \frac{10}{9}$

Cevap: D

8. \triangle | 1 2 3 4 5 $e = 3$

1 | 4 5 1 2 3

2 | 5 1 2 3 4

3 | 1 2 3 4 5

4 | 2 3 4 5 1

5 | 3 4 5 1 2

• $3 \triangle 3^{-1} = e = 3$

$\hookrightarrow 3$

• $5 \triangle 5^{-1} = e = 3$

$\hookrightarrow 1$

• $4 \triangle 4^{-1} = e = 3$

$\hookrightarrow 2$

$\Rightarrow 3^{-1} \triangle (5^{-1} \triangle 4^{-1}) = 3 \triangle (1 \triangle 2)$

$= 3 \triangle 5$

$= 5$

Cevap: E

9. $c^3 = c \triangle c \triangle c = d \triangle c = e$

d

$(d^{-2}) = (d^2)^{-1} = (d \triangle d)^{-1} = a^{-1} = c$

$(c^3 \triangle d^{-2}) \triangle x = d$

$(e \triangle c) \triangle x = d$

$a \triangle x = d$

$\hookrightarrow e$

Cevap: A

$$1. \frac{1}{x} \triangle \frac{1}{y} = \frac{2x+y}{x \cdot y}$$

$$\frac{1}{2} \triangle \frac{1}{5} = \frac{2 \cdot \frac{1}{2} + \frac{1}{5}}{\frac{1}{2} \cdot \frac{1}{5}}$$

$$2 \triangle 5 = \frac{1 + \frac{1}{5}}{\frac{1}{10}}$$

$$2 \triangle 5 = \frac{\frac{6}{5}}{\frac{1}{10}} = \frac{6}{5} \cdot \frac{10}{1} = 12$$

$$2. \quad 2 \star 8 = 2 \cdot 8 = 16 \text{ (Aralarında asal değil)}$$

$$(2 \star 8) \star 3 = 16 \star 3 = 16 + 3 = 19$$

$$3. \quad x \star y = \frac{x \cdot (y+1)!}{(x+y)!}$$

$$3 \star a = \frac{3 \cdot (a+1)!}{(a+3)!} = \frac{3}{20}$$

$$\frac{(a+1)!}{(a+3)(a+2)(a+1)!} = \frac{1}{\frac{20}{5 \cdot 4}}$$

$$a+3=5 \Rightarrow a=2$$

$$4. \quad \triangle 6 < > \triangle -2 \rightarrow \{-1, 0, 1, 2, 3, 4, 5\} \rightarrow 7 \text{ tane tam sayı}$$

$$\triangle 6 > < \triangle -2 \rightarrow -1 + 0 + 1 + 2 + 3 + 4 + 5 = 14$$

$$\Rightarrow 7 \cdot 14 = 98 \text{ olur.}$$

Cevap: D

Cevap: A

$$5. \quad \star = x \text{ ve } \square = - \text{ işlemini temsil ediyor.}$$

$$\bullet \quad (3 \star A) \square 4 = 11$$

$$3A - 4 = 11 \quad \Rightarrow 3A = 15$$

$$A = 5$$

$$\bullet \quad (2.B) - 7 = 9$$

$$(2.B) = 16 \Rightarrow B = 8$$

$$\Rightarrow B - A \cdot B = 8 - 5 \cdot 8 = 8 - 40$$

$$= -32$$

Cevap: B

Cevap: C

$$6. \quad \overline{16} \rightarrow -3 \text{ sayısına uzaklığı en fazla 16 olan tam sayılar}$$

$$-19, \dots, -3, -2, -1, 0, \dots, 13 \rightarrow 13 - (-19) + 1 = 33 \text{ tane}$$

$$\bullet \quad \overline{6} \rightarrow -3 \text{ sayısına uzaklığı en fazla 6 olan tam sayılar}$$

$$-9, \dots, -4, -3, -2, -1, 0, 1, 2, 3 \rightarrow 3 - (-9) + 1 = 13 \text{ tane}$$

$$\Rightarrow 2 \overline{x} + 16 = \overline{6} \cdot \overline{x}$$

$$2 \overline{x} + 33 = 13 \overline{x}$$

$$33 = 11 \overline{x} \Rightarrow \overline{x} = 3$$

↳ 3 tam sayı olmalı.

$$-4, -3, -2$$

$$\leftarrow \quad \rightarrow$$

$$1 \quad 1 \rightarrow x = 1 \text{ olmalı.}$$

Cevap: A

Cevap: B

$$7. \quad \triangle 3x-1 = \frac{3x-1}{3}$$

$$\square 4x+1 = \frac{4x+1}{5}$$

$$\frac{3x-1}{3} \times \frac{4x+1}{5}$$

$$15x-5 = 12x+3$$

$$3x = 8$$

$$x = \frac{8}{3}$$

Cevap: B

$$8. \quad \textcircled{n} = 3n + 1$$

$$\frac{2\textcircled{n} + 8}{2} \rightarrow 11$$

$$2\textcircled{n} + 8 = 22$$

$$2\textcircled{n} = 22 - 8$$

$$2\textcircled{n} = 14$$

$$\textcircled{n} = 7$$

$$3n+1 = 7$$

$$3n = 6$$

$$n = 2$$

Cevap: C

$$9. \quad \bullet \quad 2\textcircled{a} + \triangle b = 13$$

$$\textcircled{a} - 2\triangle b = 9$$

$$\bullet \quad 2(2a+1) + b - 3 = 13$$

$$2a+1 - 2(b-3) = 9$$

$$\bullet \quad 4a+2+b-3 = 13$$

$$2a+1-2b+6 = 9$$

$$\bullet \quad 4a+b-1 = 13$$

$$2a-2b+7 = 9$$

$$\bullet \quad 2/4a+b = 14 \rightarrow 4.3+b = 14$$

$$+ \quad 2a-2b = 2 \quad b = 2$$

$$10a = 30 \Rightarrow a = 3$$

$$\Rightarrow a.b = 3.2 = 6 \text{ olur.}$$

Cevap: D