

$$1. \quad | -3-4 | + | -7 |$$

$$| -7 | + | -7 | = 7+7=14$$

Cevap: E

$$2. \quad a < 0 < b \rightarrow 0 < b-a$$

$$\underbrace{|b-a|}_{+} + \underbrace{|-2b|}_{-} - \underbrace{|a|}_{-}$$

$$b - a + 2b + a = 3b$$

Cevap: A

$$3. \quad \underbrace{|3-\sqrt{5}|}_{+} + \underbrace{|\sqrt{5}-1|}_{+} - \underbrace{|\sqrt{2}-2|}_{-}$$

$$= 3 - \sqrt{5} + \sqrt{5} - 1 + \sqrt{2} - 2$$

$$= \sqrt{2}$$

$$4. \quad x < 0 < y \rightarrow x-y < 0$$

$$\underbrace{|x|}_{-} - \underbrace{|x-y|}_{-} - \underbrace{|y|}_{+}$$

$$-x + x - y - y = -2y$$

Cevap: A

Cevap: B

$$5. \quad \frac{8|m|+8}{2+2|m|} = \frac{-8m+8}{2-2m} = \frac{8(-m+1)}{2(-m+1)}$$

$$= 4$$

Cevap: E

$$6. \quad p < q < 0 < r \rightarrow p-r < 0 \text{ ve } q-p > 0$$

$$\underbrace{|-p|}_{+} - \underbrace{|p-r|}_{-} - \underbrace{|q-p|}_{+} - \underbrace{|q|}_{-}$$

$$-p + p - r - q + p + q = p-r$$

Cevap: B

$$7. \quad |m| = -m \Rightarrow m \leq 0$$

$$\frac{1 - \underbrace{|1-m|}_{+}}{\underbrace{|2m-3|}_{-} - \underbrace{|m-3|}_{-}} = \frac{1-1+m}{-2m+3+m-3} = \frac{m}{-m}$$

$$= -1$$

Cevap: C

$$8. \quad a < 0 < b \rightarrow a-b < 0$$

$$\frac{\underbrace{|a^2|}_{+} - \underbrace{|b^2|}_{+} + \underbrace{|a-b|}_{-}}{b-a}$$

$$\frac{a^2 - b^2 - a + b}{b-a} = \frac{(a-b)(a+b) - (a-b)}{b-a}$$

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

$$= 1 - a - b$$

Cevap: E

$$9. \quad |3-4| = |-1| = 1$$

$$|3| - |4| = 3-4 = -1$$

$$|3-4| \neq |3| - |4|$$

Cevap: E

$$10. \quad \frac{1}{a} < \frac{1}{b} < \frac{1}{c} \Rightarrow c < b < a$$

$$\Rightarrow 0 < a-c, \quad b-a < 0, \quad 0 < b-c$$

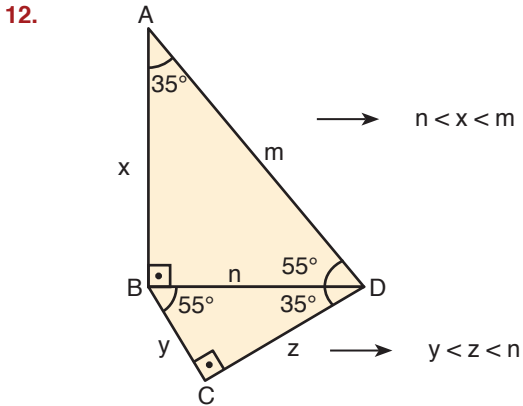
$$\underbrace{|a-c|}_{+} + \underbrace{|b-a|}_{-} + \underbrace{|b-c|}_{+}$$

$$a-c - b + a + b - c = 2a-2c$$

Cevap: C

11. • $z < 0$
 • $x + y < y + z \rightarrow x < z$
 • $y + z < x + z \rightarrow y < x$
 $\Rightarrow y < x < z < 0$
 $\rightarrow z - y > 0, \quad x - y > 0$
 $\Rightarrow |z - y| + |x| + |x - y|$
 $z - y - x + x - y = z - 2y$

Cevap: E



$$\Rightarrow y < z < n < x < m$$

I. $|n - y| = |m - n|$
 $n - y = m - n$
 $y = m$ hatalı

II. $|n - x| < |z - m|$ $z < n < x < m$
 $|2 - 3| < |1 - 4|$ 1 2 3 4
 $1 < 3$ doğru

III. $|y - x| = x - y$
 $x - y = x - y$ doğru

Cevap: E

13. $\sqrt{b^2 - 2ab + a^2} + \frac{a}{\sqrt{a^2}} + \frac{b^2}{\sqrt[3]{b^3}} = -9$

$$\sqrt{(b-a)^2} + \frac{a}{|a|} + \frac{b^2}{b} = -9$$

$$|b-a| + \frac{a}{|a|} + b = -9$$

$$-b + a + \frac{a}{-a} + b = -9$$

$$a - 1 = -9$$

$$a = -8$$

Cevap: B

14. $\sqrt[4]{(-a)^4} + \sqrt{(2a-b)^2}$

$$|-a| + |2a-b|$$

$$-a - 2a + b = b - 3a$$

Cevap: D

$$\begin{aligned}
 1. \quad m+4=n &\rightarrow m-n=-4 \text{ ve } n-m=4 \\
 &\Rightarrow 5|m-n|-2|n-m| \\
 &5 \cdot |-4|-2|4| \\
 &5 \cdot 4 - 2 \cdot 4 = 20 - 8 = 12
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 2. \quad a=b+2 &\Rightarrow a-b=2 \rightarrow b-a=-2 \\
 |b-a|-b &= 8 \\
 |-2|-b &= 8 \\
 2-8 &= b \\
 -6 &= b \Rightarrow a=b+2 \\
 &a=-6+2=-4
 \end{aligned}$$

Cevap: A

$$\begin{aligned}
 3. \quad \frac{|5a-5b|+|3b-3a|}{|11b-11a|-|9a-9b|} &= \frac{5|a-b|+3|a-b|}{11|a-b|-9|a-b|} \\
 &= \frac{8|a-b|}{2|a-b|} = \frac{8}{2} = 4
 \end{aligned}$$

Cevap: B

$$\begin{aligned}
 4. \quad |-4x| + |3x| + |-2x| \\
 |-4| \cdot |x| + 3|x| + |-2| \cdot |x| \\
 4|x| + 3|x| + 2|x| = 9|x| \\
 = 9m
 \end{aligned}$$

Cevap: E

$$\begin{aligned}
 5. \quad |a-4| + |b+5| + |c-6| &= 0 \\
 \Rightarrow a-4=0 & \quad b+5=0 & \quad c-6=0 \\
 a=4 & \quad b=-5 & \quad c=6 \\
 |a-c| + |b-c| &= |4-6| + |-5-6| \\
 &= |-2| + |-11| \\
 &= 2 + 11 \\
 &= 13
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 6. \quad |2x-4y-15| &= -|x+4y-9| \\
 |2x-4y-15| + |x+4y-9| &= 0 \\
 \underbrace{|2x-4y-15|}_0 + \underbrace{|x+4y-9|}_0 &= 0 \\
 2x-4y-15 &= 0 \\
 + \quad x+4y-9 &= 0 \rightarrow 8+4y-9=0 \\
 \hline 3x-24 &= 0 & \quad 4y-1=0 \\
 3x &= 24 & \quad y = \frac{1}{4} \\
 x &= 8 \\
 \Rightarrow x \cdot y &= 8 \cdot \frac{1}{4} = 2
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 7. \quad |5m-3n| &= 0 \Rightarrow 5m-3n=0 \\
 \underbrace{|5m-3n|}_0 &= 0 \Rightarrow 5m-3n=0 \\
 5m &= 3n \\
 m &= 3k \\
 n &= 5k \\
 \frac{2m-n}{3m-2n} &= \frac{2 \cdot 3k - 5k}{3 \cdot 3k - 2 \cdot 5k} = \frac{6k-5k}{9k-10k} = \frac{k}{-k} = -1
 \end{aligned}$$

Cevap: A

$$\begin{aligned}
 8. \quad \bullet \quad \frac{\bar{m}}{|m|} + \frac{|n|}{n} &= 0 \Rightarrow m > 0 \Rightarrow n < 0 \\
 & \quad \quad \quad m < 0 \Rightarrow m > 0 \text{ olmalı} \\
 + \frac{m}{m} + \frac{-n}{n} &= 1 - 1 = 0 \\
 \bullet \quad \text{I. } \frac{+m}{-n} < 0 & \text{ doğru} \\
 \text{II. } m+n=0 & \text{ her zaman olmayabilir.} \\
 + \quad - \\
 \text{III. } m=n & \text{ her zaman olmayabilir.}
 \end{aligned}$$

Cevap: A

9. $|2x - 4| = 6$

$$\begin{array}{l} 2x - 4 = 6 \\ 2x = 10 \\ x = 5 \end{array} \quad \begin{array}{l} 2x - 4 = -6 \\ 2x = -2 \\ x = -1 \end{array}$$

\Rightarrow Toplamları $5 + (-1) = 4$

Cevap: A

10. $|a - 1| = 4$

$$\begin{array}{l} a - 1 = 4 \\ a = 5 \end{array} \quad \begin{array}{l} a - 1 = -4 \\ a = -3 \end{array}$$

a = 5 için $|a - |3a - 1|| - 2 = |5 - |15 - 1|| - 2$

$$= |5 - 14| - 2$$

$$= |-9| - 2$$

$$= 9 - 2 = 7$$

a = -3 için $|a - |3a - 1|| - 2 = |-3 - |-9 - 1|| - 2$

$$= |-3 - 10| - 2$$

$$= |-13| - 2$$

$$= 13 - 2 = 11$$

\Rightarrow Toplamları $7 + 11 = 18$

Cevap: C

11. $||a + 1| - 5| = 3$

$$\begin{array}{l} |a + 1| - 5 = 3 \\ |a + 1| = 8 \\ \begin{array}{l} a + 1 = 8 \\ a = 7 \end{array} \quad \begin{array}{l} a + 1 = -8 \\ a = -9 \end{array} \end{array} \quad \begin{array}{l} |a + 1| - 5 = -3 \\ |a + 1| = 2 \\ \begin{array}{l} a + 1 = 2 \\ a = 1 \end{array} \quad \begin{array}{l} a + 1 = -2 \\ a = -3 \end{array} \end{array}$$

\Rightarrow Toplamları $-9 - 3 + 7 + 1 = -4$

Cevap: D

12. $|3x + 7| = 2x + 3$

$$\begin{array}{l} 3x + 7 = 2x + 3 \\ x = -4 \end{array} \quad \begin{array}{l} 3x + 7 = -2x - 3 \\ 5x = -10 \\ x = -2 \end{array}$$

\downarrow
-4 yerine yazıldığında denklemleri sağlamaz.

\Rightarrow ÇK: $\{-2\}$

Cevap: C

13. • $|2x - 1| = 5$

$$\begin{array}{l} 2x - 1 = 5 \\ 2x = 6 \\ x = 3 \end{array} \quad \begin{array}{l} 2x - 1 = -5 \\ 2x = -4 \\ x = -2 \end{array}$$

• $|y - 2| = x = 3 \rightarrow$ pozitif olanı aldık.

$$|y - 2| = 3$$

$$\begin{array}{l} y - 2 = 3 \\ y = 5 \end{array} \quad \begin{array}{l} y - 2 = -3 \\ y = -1 \end{array}$$

Cevap: B

14. $|25 - x^2| = |2x - 10|$

$$|(5 - x)(5 + x)| = 2|x - 5|$$

$$|5 - x| |x + 5| = 2|x - 5| \quad \left(\begin{array}{l} x - 5 = 0 \\ x = 5 \end{array} \right)$$

$$|x + 5| = 2$$

$$\begin{array}{l} x + 5 = 2 \\ x = -3 \end{array} \quad \begin{array}{l} x + 5 = -2 \\ x = -7 \end{array}$$

ÇK: $\{-7, -3, 5\}$ olmak üzere 3 elemanlıdır.

Cevap: D

$$1. \quad |x+4| = x+4 \rightarrow x+4 \geq 0 \quad x \geq -4$$

$$|x-8| = 8-x \rightarrow 8-x \geq 0 \quad 8 \geq x$$

$$\Rightarrow -4 \leq x \leq 8$$

x değerleri toplamı

$$-4 - 3 - 2 - 1 + 0 + 1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 = 26$$

Cevap: C

$$2. \quad |8-4x| + |2-x| = 24 - |x-2|$$

$$4|2-x| + |2-x| = 24 - |x-2|$$

$$5|2-x| + |x-2| = 24$$

$$6|x-2| = 24$$

$$|x-2| = 4$$

$$\begin{array}{l} x-2=4 \\ x=6 \end{array} \quad \begin{array}{l} x-2=-4 \\ x=-2 \end{array}$$

$$\Rightarrow |6| + |-2| = 6 + 2 = 8$$

Cevap: C

$$3. \quad |5-x| + |15-3x| = m$$

$$|5-x| + 3|5-x| = m$$

$$4|5-x| = m$$

$$|x-5| = \frac{m}{4}$$

$$\begin{array}{l} x-5 = \frac{m}{4} \\ x = 5 + \frac{m}{4} \end{array} \quad \begin{array}{l} x-5 = \frac{-m}{4} \\ x = 5 - \frac{m}{4} \end{array}$$

$$x = 5 + \frac{m}{4} \quad x = 5 - \frac{m}{4}$$

$$\Rightarrow \left(5 + \frac{m}{4}\right) \left(5 - \frac{m}{4}\right) = 16 \Rightarrow 25 - \frac{m^2}{16} = 16$$

$$9 = \frac{m^2}{16} \Rightarrow m^2 = 144$$

$$m = 12$$

Cevap: C

$$4. \quad |c+3| = 0 \Rightarrow c+3=0$$

$$c = -3$$

$$\bullet \quad |b+c| = |b-3| = 2$$

$$\begin{array}{l} b-3=2 \\ b=5 \end{array} \quad \begin{array}{l} b-3=-2 \\ b=1 \end{array}$$

$$\bullet \quad |a+b| = |a+5| = 4$$

$$\begin{array}{l} a+5=4 \\ a=-1 \end{array} \quad \begin{array}{l} a+5=-4 \\ a=-9 \end{array}$$

$$|a+b| = |a+1| = 4$$

$$\begin{array}{l} a+1=4 \\ a=3 \end{array} \quad \begin{array}{l} a+1=-4 \\ a=-5 \end{array}$$

$$a \in \{-9, -5, -1, 3\}$$

Cevap: B

$$5. \quad |a| = 2 \Rightarrow a = 2, \quad a = -2$$

$$|b| = 4 \Rightarrow b = 4, \quad b = -4$$

$$|c| = 7 \Rightarrow c = 7, \quad c = -7$$

$$|a+b+c| = |-2-4-7| = |-13| = 13$$

$$|a+b+c| = |2-4-7| = |-9| = 9$$

$$|a+b+c| = |-2+4-7| = |-5| = 5$$

$$|a+b+c| = |-2-4+7| = |1| = 1$$

Cevap: C

6. • $a \cdot b \cdot c < 0$
↳ ya üçüde negatif ya da iki pozitif bir negatif

• $c < a < b$
↓ ↓ ↓
kesin -3 -6 → olamaz
negatif ↓ ↓
 $c = -8$ 3 6

⇒ $a + b + c = 3 + 6 - 8 = 1$

Cevap: C

7. I. $|-5| = 5$ doğru
II. $|7| = 7$ olmalı. Hatalı
III. $|0| = 0$ doğru

Cevap: C

8. $\frac{\frac{9}{3}}{\frac{3}{3}} = \frac{|5+9| \cdot |5-9|}{|4+3| \cdot |4-3|} = \frac{14 \cdot 4}{7 \cdot 1} = 8$

Cevap: D

9. • $|m| = |n| \Rightarrow m = -n$ ($m < 0 < n$)

• $3n - 5m = 24$

↓
-n

$3n + 5n = 24 \Rightarrow 8n = 24$ ve $n = 3$

• $m = -n \Rightarrow m = -3$

O halde $m \cdot n = -3 \cdot 3 = -9$ olur.

Cevap: C

10.

$$|3m - 4n| = 3m$$

$$\begin{array}{l} 3m - 4n = 3m \\ -4n = 0 \\ n = 0 \text{ (olamaz)} \end{array} \quad \begin{array}{l} 3m - 4n = -3m \\ 6m = 4n \\ \boxed{3m = 2n} \\ m = 2k \text{ ve } n = 3k \end{array}$$

$$\Rightarrow \left| \frac{m+4n}{m-3n} \right| = \left| \frac{2k+4 \cdot 3k}{2k-3 \cdot 3k} \right| = \left| \frac{14k}{-7k} \right| = \frac{14|k|}{7|k|} = 2$$

Cevap: D

11.

$$|x+1| \cdot |2x-2| = 4$$

$$|x+1| \cdot 2 \cdot |x-1| = \frac{2}{2}$$

$$|x+1| \cdot |x-1| = 2$$

$$|(x+1)(x-1)| = 2$$

$$|x^2-1| = 2$$

$$\begin{array}{l} x^2-1=2 \\ \boxed{x^2=3} \end{array} \quad \begin{array}{l} x^2-1=-2 \\ x^2=-1 \text{ (olamaz)} \end{array}$$

Cevap: B

12.

$$\begin{array}{l} 3|a| = 12 \\ |a| = 4 \\ a = 4 \quad a = -4 \end{array} \quad \begin{array}{l} |b| = 12 \\ b = 12 \quad b = -12 \end{array} \quad \begin{array}{l} 2|c| = 12 \\ |c| = 6 \\ c = 6 \quad c = -6 \end{array}$$

$$|a+b+c| = |-4+12-6| = 2$$

$$|a+b+c| = |4+12-6| = 10$$

$$|a+b+c| = |-4+12+6| = 14$$

$$|a+b+c| = |4+12+6| = 22$$

Cevap: D

13. • $|c-b| = a$

$c-b = a$ $c-b = -a$ ($c-b > 0, a > 0$)

$c-b = -a$ olamaz.

• $|a-c| = c-b = a$

$a-c = a$ $a-c = -a$

$0 = c$ $c = 2a$

olamaz

• $c-b = a \Rightarrow 2a - b = a$

$a = b$

$\Rightarrow \frac{a}{b} = 1$

Cevap: B

14. • $|a-b| = 3a$

$a-b = 3a$ $a-b = -3a$

$b = -2a$ $b = 4a$

$2 = -2a$ $2 = 4a$

$a = -1$ $\frac{1}{2} = a$

(olamaz)

$\Rightarrow a \cdot b = \frac{1}{2} \cdot 2 = 1$

• $ab - 2a = 0$

$ab = 2a$

$b = 2$

Cevap: C

1. $|x-4| - 3 < 6$

$|x-4| < 9$

$-9 < x-4 < 9$

$-5 < x < 13 \rightarrow (-5, 13) = (a, b)$

$a = -5$ ve $b = 13$

$a + b = -5 + 13 = 8$

Cevap: E

2. $|x-m| < 16$

$-16 < x-m < 16$

$m-16 < x < 16+m$

14 olmalı $\Rightarrow x \in \{1, 2, 3, \dots, 13\}$

$16+m = 14$

$m = -2$

$\Rightarrow m = -2$ için $m-16 < x < 16+m$

$-18 < x < 14$

$x \in \{-17, -16, \dots, -1\}$

17 negatif tam sayı

Cevap: E

3. $1 < |2x+5| \leq 9$

$1 < 2x+5 \leq 9$

$-4 < 2x \leq 4$

$-2 < x \leq 2$

↓

$-1 + 0 + 1 + 2 = 2$

$\Rightarrow 2 + (-22) = -20$

$1 < -2x-5 \leq 9$

$6 < -2x \leq 14$

$-7 \leq x < -3$

$-7 - 6 - 5 - 4 = -22$

Cevap: B

4. $|2x-m| \leq n$

$-n \leq 2x-m \leq n$

$m-n \leq 2x \leq m+n$

$\frac{m-n}{2} \leq x \leq \frac{m+n}{2}$ ve $-1 \leq x \leq 5$

$\Rightarrow \frac{m-n}{2} = -1$ ve $\frac{m+n}{2} = 5$

$m-n = -2$ $m+n = 10$

$\Rightarrow m-n = -2$

$+ \frac{m+n = 10}{2m = 8} \Rightarrow 4+n = 10$

$2m = 8$ $n = 6$

$m = 4$

O halde $m \cdot n = 4 \cdot 6 = 24$ olur.

Cevap: E

5. $\frac{-\text{ya da } 0}{|x-2| - 5} \leq 0 \Rightarrow |x-2| - 5 \leq 0$

$+ \frac{|x-3|}{|x-2| - 5} \leq 0$

$|x-2| \leq 5$

$-5 \leq x-2 \leq 5$

$-3 \leq x \leq 7$

$x \in \{-3, -2, -1, 0, 1, 2, 4, 5, 6, 7\}$

10 farklı x değeri var.

Cevap: D

6. • $|x-1| \leq 3$

$-3 \leq x-1 \leq 3$

• $2 / -2 \leq x \leq 4$

$-4 \leq 2x \leq 8$

$-4 \leq y \leq 8$

ÇK: $[-4, 8]$

• $\frac{3y-2x}{4} = x$

$3y-2x = 4x$

$3y = 6x$

$y = 2x$

Cevap: A

7. x gerçel sayılarının 2 noktasına uzaklığı $|x-2|$ ile ifade edilir.

Bu uzaklığın 3 ile 5 arasında olması isteniyor.

$3 \leq |x-2| \leq 5$

Cevap: A

8. • $|a| = -a \Rightarrow a \leq 0$
 • $b < |b| \Rightarrow b < 0$
 - ya da 0
 I. $\frac{a}{-b} \geq 0$ doğru
 II. $a \cdot b \leq 0$ olmalıydı hatalı
 III. $a + b < 0$ doğru

Cevap: D

9. • $a^4 \cdot b^3 < 0$
 $\begin{matrix} + \\ \downarrow \\ - \end{matrix} \rightarrow b < 0$
 • $|a + b| < |a| + |b| \Rightarrow a$ ile b zıt işaretli olmalı
 $\Rightarrow b < 0$ olduğundan $a > 0$ olmalı.
 I. $a \cdot b < 0$ olmalı. Hatalı
 $\begin{matrix} + \\ - \end{matrix}$
 II. $a > 0$ doğru
 III. $a + b < 0$ bilgi yetersiz
 $\begin{matrix} + \\ - \\ ? \end{matrix}$
 Yalnız II doğru

Cevap: B

10.

$m \cdot k < k$	$k = 0$	$0 < n - m$
$m < 2k$	k negatif	$m < n$
	m 'de negatif	
$m \cdot k < 0$		$k < n \cdot m$
$m > k$	$m - k < n - m$	$k + m < n \rightarrow$ III ✓
	$2m < n + k$	

n değeri için kesin bir sonuç bulunmadığından dolayı I. ve II. doğruluğu kesin değildir.

Cevap: B

11. • $|y| = -y \Rightarrow -y > 0$ ve $y < 0$ olur.
 • $x < |x| \Rightarrow x < 0$ olur.

- I. $x < 0$ ve $y < 0$ olduğundan $y - x < 0$ olmayabilir.
 $x = -4$ ve $y = -3$ için
 $-3 - (-4) > 0$
 $1 > 0$
 II. $y \cdot |x| < 0$ daima doğrudur.
 $\begin{matrix} \downarrow \\ - \\ \downarrow \\ + \end{matrix}$
 III. $|y| - |x|$ işleminin sonucu negatif veya pozitif olabilir.
 $\begin{matrix} \downarrow & \downarrow \\ + & + \end{matrix}$

Cevap: B

12. • $2a - b = 30$ ($2a > b$)
 $\begin{matrix} + \\ b - a = 60 \end{matrix} \rightarrow b - 90 = 60$
 $a = 90$ $b = 150$
 $\Rightarrow a + b = 90 + 150 = 240$ olabilir.
 • $\neg b - 2a = 30$ ($b > 2a$)
 $\begin{matrix} + \\ b - a = 60 \end{matrix} \rightarrow b - 30 = 60$
 $a = 30$ $b = 90$
 $\Rightarrow a + b = 30 + 90 = 120$ olabilir.
 O halde I ve III olabilir.

Cevap: D

13. Can = x , Veli = y sayılarını tutsun.

- Can $\rightarrow x = y + 4$
 • Veli $\rightarrow |y| = |x| + 2$
 $\Rightarrow |y| = |y + 4| + 2$
 $\begin{matrix} \swarrow & \searrow \\ y = y + 4 + 2 & -y = y + 4 + 2 \\ 0 = 6 & -2y = 6 \\ ! & y = -3 \end{matrix}$
 $y = -3 \Rightarrow x = y + 4 = -3 + 4 = 1$ olur.
 O halde $x + y = 3 + 1 = -2$ olur.

Cevap: E