

Week III

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$$x < y \Rightarrow \begin{cases} x \times c < y \times c \\ x \div c < y \div c \end{cases} \quad \left\{ \begin{array}{l} \text{negatif sayıyla çarpma bölmede işaret yer değiştirir} \end{array} \right.$$

$$x > y > z \Rightarrow \frac{1}{x} < \frac{1}{y} < \frac{1}{z}$$

$$...a^5 > a^4 > a^3 > a^2 > a \Rightarrow a > 1$$

$$...a^5 < a^4 < a^3 < a^2 < a \Rightarrow 0 < a < 1$$

$$a < a^2 < |a| \Rightarrow -1 < a < 0$$

$$a < b$$

$$x < y$$

$$= a + x < b + y$$

Problem 0.1 $-4 \leq x < 5$, $-3 < y < 4$ ise $3x - 2y$ 'nin en büyük ve en küçük tamsayı?

Sol.

$$-12 \leq 3x < 15$$

En büyük: 20

$$-8 < -2y < 6$$

En küçük: -19

$$-20 < 3x - 2y < 21$$

□

Problem 0.2 $-3 < x < 5$, $-2 < y < 6$, x ve $y \in \mathbb{Z}$ ise $3x - 2y$ 'nin max değeri?

Sol.

$$x = 4$$

$$3 \times 4 + -2 \times -1 = 14$$

$$y = -1$$

□

Problem 0.3 $-6 \leq x < 2$, $3x + 2y = 24$ ise y 'nin tanım aralığı?

Sol.

$$\begin{aligned}x &= -6 & -6 < -3x \leq 18 \\y &= 21 & 18 < 24 - 3x \leq 42 \\x &= 2 & 9 < 24 - 3x \div 2 \leq 21 \\y &= 9 \\9 &< y \leq 21\end{aligned}$$

□

Problem 0.4 $-2 < x \leq 5$ ise $x^2 = ?$

Sol.

$$4 < x^2 < 25$$

□

Problem 0.5 $-4 < x < 3$ ise $x^2 = ?$

Sol.

$$0 < x^2 < 16$$

□

Problem 0.6 $-2 < x < 5$ ise $(x^2 - 2x)_{max} = ?$

Sol.

$$\begin{aligned}(x^2 - 2x + 1) - 1 & & -3 < (x - 1)^2 < 4 \\(x - 1)^2 - 1 & & 0 < (x^2 - 1)^2 < 16 \\& & -1 < (x^2)^2 - 1 < 15\end{aligned}$$

□

Problem 0.7 $-5 < x < 2$ ise x^3 tanım aralığı?

Sol.

$$\begin{aligned}-125 &< x < 8 \\-2 &< x \leq 6\end{aligned}$$

□

Problem 0.8 $-4 \leq y < 3$ ise $x \times y$ aralığı?

Sol.

$$-24 \leq x \times y < 18 \quad \begin{cases} -24, \\ -12, \\ -6, \\ 8, \\ 18 \end{cases}$$

□

Problem 0.9 $x, y, z \in R, x \leq y < z, x \times y - y \times z < 4x - 4z$ ise y tanım aralığı?

Sol.

$$\begin{aligned} (x - z) \times y(x - z) \times 4 \\ y > 4 \end{aligned}$$

□

Problem 0.10 $-a \text{ times } b < b \times c < a \times c$ ($1 \div a \text{ times } b \times c$), $a, b, c \in R+$ ise a, b, c sıralayınız.

Sol.

$$\begin{aligned} \frac{1}{c} > \frac{1}{b} > \frac{1}{a} \\ c > b > a \\ a^2 < a \end{aligned}$$

□

Problem 0.11 $-a^2 < a, b < b^3 < b^2$ ise $a + b$ tanım aralığı?

Sol.

$$\begin{aligned} 0 < a < 1 \\ -1 < b < 0 \\ -1 < a + b < 1 \end{aligned}$$

□

Problem 0.12 – A’dan B’ye gitmek için 2 yol var;

I. yol = $410 - 2x$ km

II. yol = $3x + 10$ km

1. yol, II. yoldan daha kısa ise x tanım aralığı?

Sol.

$$410 - 2x < 3x + 10$$

$$400 < 5x$$

$$80 < x$$

□