



Решите неравенство:

1)  $(x+2)(x-8)(x+5) < 0$ ;

2)  $(x+5)^2(x-6)(8-x) \geq 0$ ;

3)  $\frac{x}{x-3} + \frac{2}{x} - \frac{2}{x^2-3x} \leq 0$ .

4)  $(x^2-36)\sqrt{x+4} \geq 0$ .

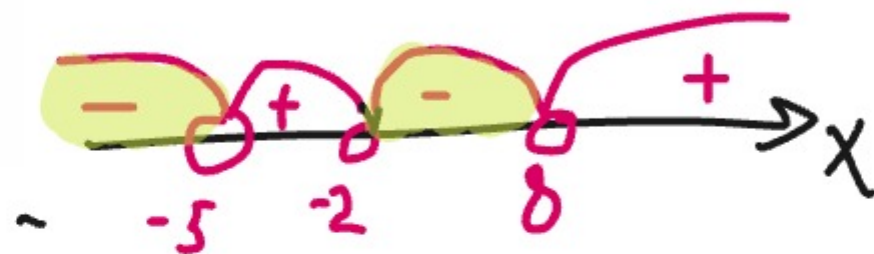
1)  $(x+2)(x-8)(x+5) < 0$

$(x+2)(x-8)(x+5) = 0$

$x = -2$

$x = 8$

$x = -5$



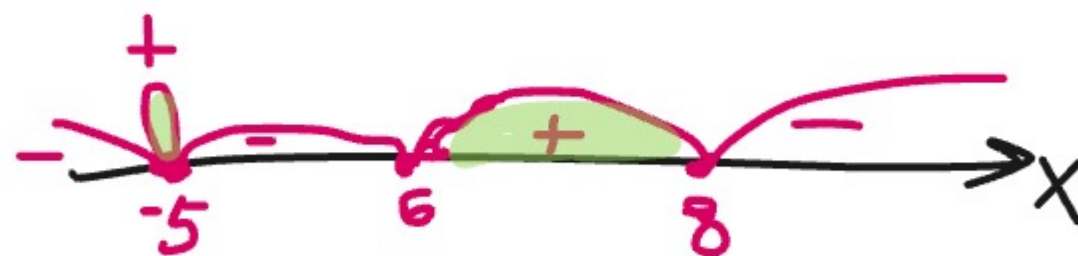
$x \in (-\infty; -5) \cup (-2; 8)$

2) Так как:

$(x+5)^2 = (x+5)(x+5)$

"

$(x+5)(x+5)(x-6)(8-x) \geq 0$



$x \in \{-5\} \cup [6; 8]$

$x = -5$

$x = 6$

$x = 8$

$$3) \frac{x}{x-3} + \frac{2}{x} - \frac{2}{x^2-3x} \leq 0$$

$$\left. \begin{array}{l} x-3 \neq 0; x \neq 3 \\ x \neq 0 \\ x^2-3x \neq 0, x(x-3) \neq 0; x \neq 0; x \neq 3 \end{array} \right\} \begin{array}{l} x \neq 0 \\ x \neq 3 \end{array} \quad | \quad \text{OD3}$$

$$\frac{x^{1x}}{x-3} + \frac{2^{1x-3}}{x} - \frac{2}{x(x-3)} \leq 0$$

$$\frac{x^2 + 2x - 6 - 2}{x(x-3)} \leq 0 ;$$

$$\frac{x^2 + 2x - 8}{x(x-3)} \leq 0$$

$$\frac{x^2 + 2x - 8}{x(x-3)} \leq 0$$

$\frac{+}{-}$

$$\begin{cases} x^2 + 2x - 8 \geq 0 \\ x(x-3) < 0 \end{cases}$$

$\frac{+}{+}$

$$\begin{cases} x^2 + 2x - 8 \leq 0 \\ x(x-3) > 0 \end{cases}$$

$$x^2 + 2x - 8 = 0$$

$$\Delta = b^2 - 4ac = 36 = 6^2$$

$$x = \frac{-b \pm \sqrt{\Delta}}{2a}$$

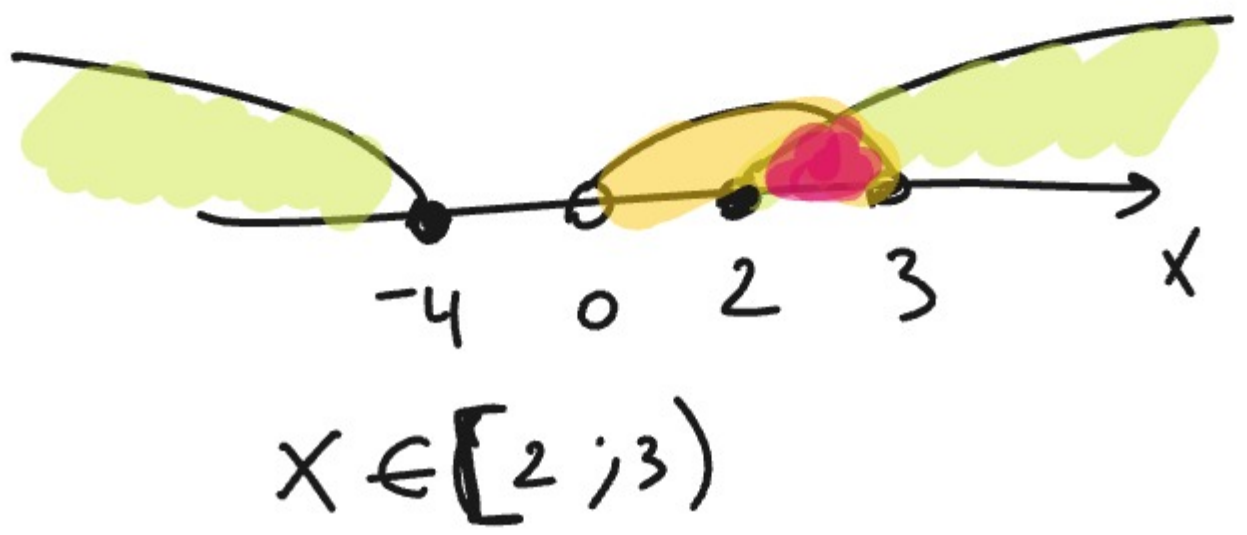
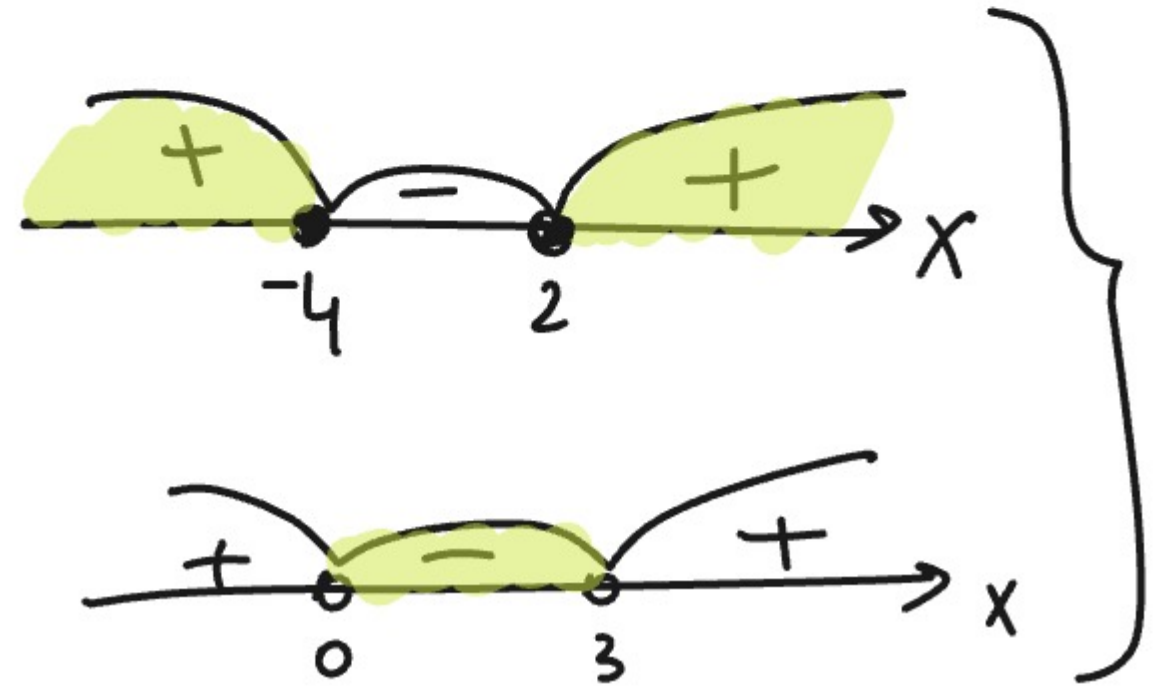
$$x = \frac{-2 + 6}{2} = \frac{4}{2} = 2$$

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

$$\begin{cases} x^2 + 2x - 8 \geq 0 \\ x(x-3) < 0 \end{cases}$$

$$\begin{cases} (x-2)(x+4) \geq 0 \\ x(x-3) < 0 \end{cases}$$

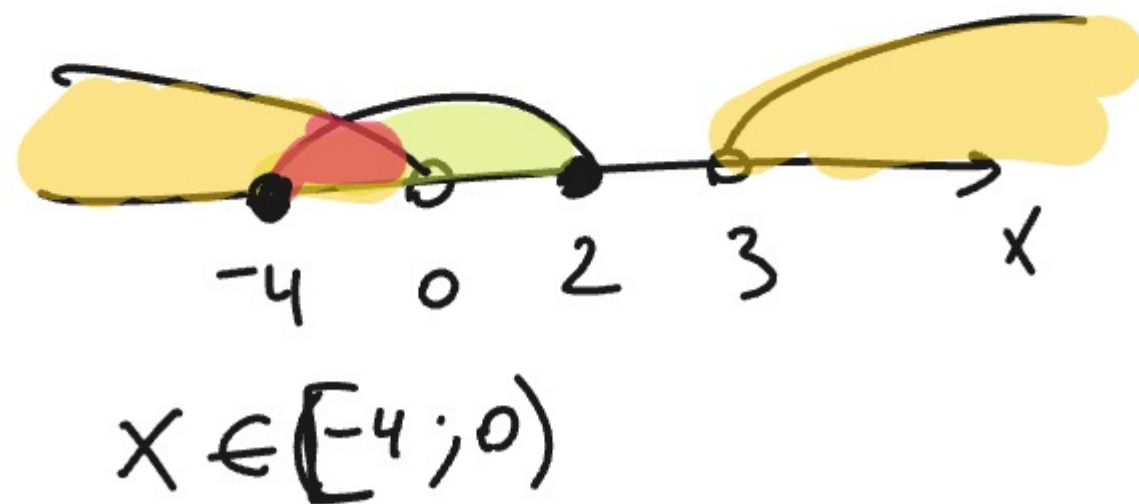
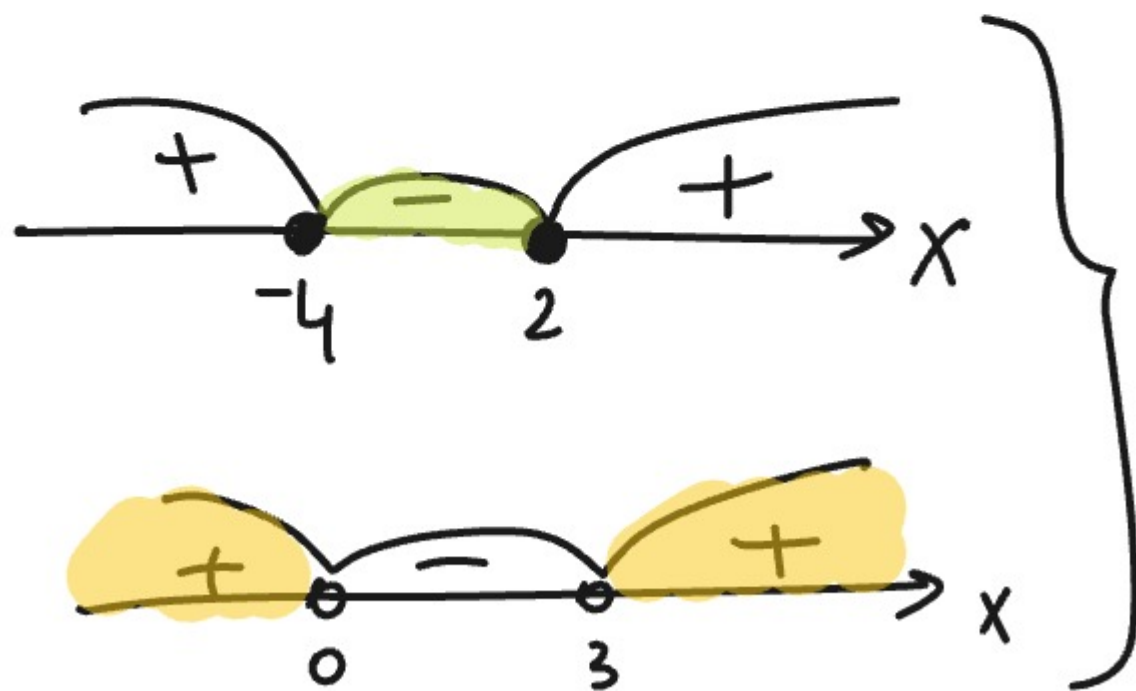
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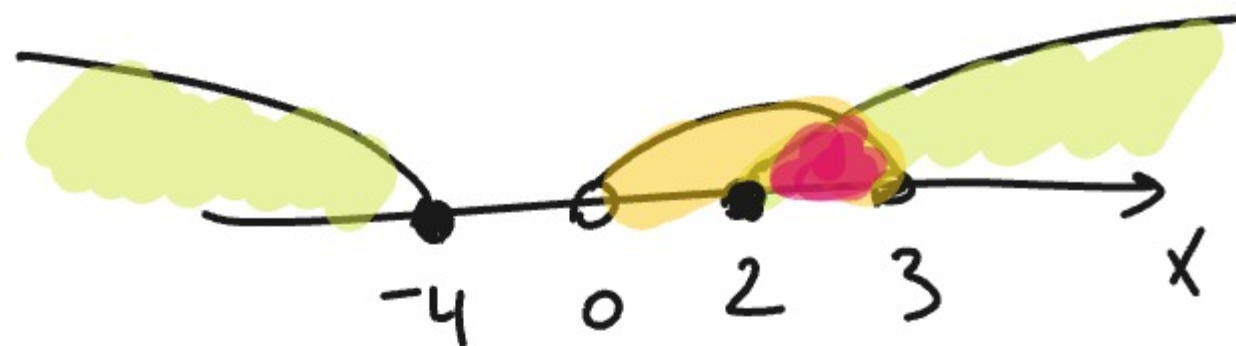




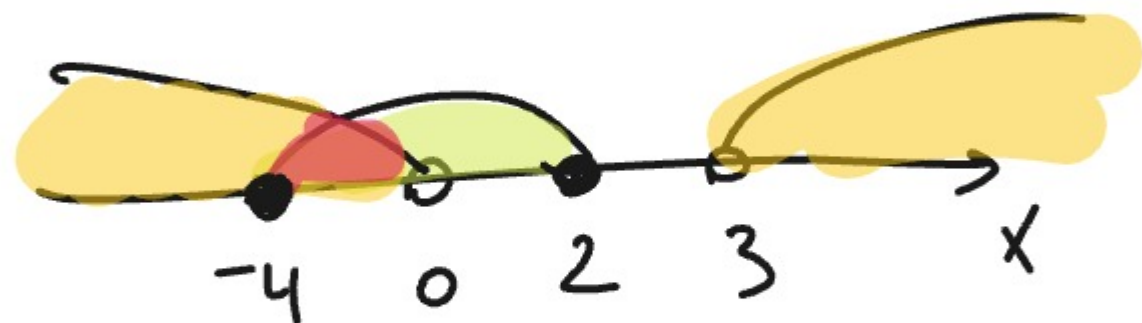
$$\begin{cases} x^2 + 2x - 8 \leq 0 \\ x(x-3) > 0 \end{cases}$$

$$\begin{cases} (x-2)(x+4) \leq 0 \\ x(x-3) > 0 \end{cases}$$





$$x \in [2; 3)$$



$$x \in [-4; 0)$$

KAP



$$x \in [-4; 0) \cup [2; 3)$$

$$\sqrt{2x+3} - \sqrt{4-x} = 2$$

$$(\sqrt{2x+3} - \sqrt{4-x})^2 = 4$$

$$2x+3 - 2\sqrt{2x+3} \cdot \sqrt{4-x} + 4-x = 4$$

$$x+7 - 2\sqrt{2x+3} \cdot \sqrt{4-x} = 4$$

$$-2\sqrt{2x+3} \cdot \sqrt{4-x} = -3-x \quad | :(-1)$$

$$2\sqrt{2x+3} \cdot \sqrt{4-x} = 3+x \quad | \uparrow^2$$

$$2. \quad 4 \cdot (2x+3) \cdot (4-x) = 9 + 6x + x^2$$

$$(8x+12) \cdot (4-x) = 9 + 6x + x^2$$

$$32x - 8x^2 + 48 - 12x - 9 - 6x - x^2 = 0$$

$$14x - 9x^2 + 39 = 0$$

$$-9x^2 + 14x + 39 = 0 \quad | (-1)$$

$$9x^2 - 14x - 39 = 0$$

$$x = -\frac{13}{9} \approx -1,44; x = 3$$

1003

$$(2x+3)(4-x) \geq 0$$

$$-2x^2 + 8x + 12 - 3x \geq 0$$

$$-2x^2 + 5x + 12 \geq 0$$

$$2x^2 - 5x - 12 \leq 0$$

$$2x+3 \geq 0 \quad 4-x \geq 0$$

$$2x \geq -3 \quad x \geq 4$$

$$x \geq -\frac{3}{2}$$

$$9x^2 - 14x - 39 = 0$$

$$D = 62 - 4ac = (-14)^2 - 4 \cdot 9 \cdot (-39) = 196 + 1404 = 1600 = 40^2$$

$$x_1 = \frac{-b \pm \sqrt{D}}{2a} = \frac{14 \pm 40}{18} = \frac{54}{18} = 3$$

$$x_2 = \frac{14 - 40}{18} = \frac{-26}{18} = -\frac{13}{9}$$

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$$(2x+3)(4-x) \geq 0$$

ПРОВЕРКА

$$\sqrt{2x+3} - \sqrt{4-x} = 2$$

$$\sqrt{2 \cdot 3 + 3} - \sqrt{4 - 3} = 2$$

$$3 - 1 = 2$$

$$2 = 2 \text{ (верно)}$$