

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

$$2(x^2 - 2x + 1) + y^2 + 4y + 9 = 0$$

برای مربع کردن برای مربع کردن

-1

$$K = 2(1) + 9 = 11$$

$$a^2 + 4a = 2a + a + 2 \rightarrow a^2 + a - 2 = 0 \rightarrow (a-1)(a+2) = 0 \Rightarrow a = 1 \text{ or } -2$$

-2

$$f(1) = (1)^2 + 2(1) = 5$$

$$\text{if } x = -3 \rightarrow 11 - b = a - 4 \rightarrow a + b = 15$$

-3

$$\sqrt{12-a} + \sqrt{b-4} = y$$

$$a \leq 12 \quad b \geq 4$$

$$a = 12 \quad b = 4$$

$$\frac{b}{a} = \frac{4}{12} = \frac{1}{3}$$

-4

$$\text{الف) } \sqrt{\frac{x+1}{|x-3|}} \quad x \begin{matrix} \nearrow -1 \\ \searrow 3 \end{matrix}$$

$$\frac{x}{p} \mid \begin{matrix} -1 & 3 \\ - & + \end{matrix} \quad [-1, +\infty) - \{3\}$$

-5

$$\sqrt{\frac{4-x}{(x+2)^2}} \quad x \begin{matrix} \nearrow 4 \\ \searrow -2 \end{matrix}$$

$$\frac{x}{p} \mid \begin{matrix} -2 & 4 \\ + & - \end{matrix} \quad (-\infty, 4] - \{-2\}$$

$$[-1, 4] - \{3\}$$

$$\text{ب) } \textcircled{I} [x] \gg 2 \rightarrow x \gg 2$$

$$\textcircled{II} [x] \ll 2 \rightarrow x \ll 2 \rightarrow \emptyset$$

الف) $\frac{(x-3)(x+2)}{(x^2-4)(x^2-9)} > 0$

x	-3	-2	2	3
P	+	+	-	+

 $(-\infty, -3) \cup (2, +\infty) - \{3\}$

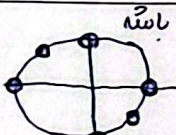
ب) $\frac{(x-1)(x-3)(x+2)}{(x+1)(x-2)(x+3)} > 0$

	-3	-2	-1	1	2	3
	+	-	+	-	+	-

 $(-\infty, -3) \cup [-2, -1) \cup (1, 2) \cup (3, +\infty)$

الف) $[-x] > 2 \Rightarrow -x > 2 \Rightarrow x < -2$

ب) $\frac{5x^2+4}{([x]-3)([x]+1)}$
 نیمی بازه باشد $[x] \neq 3 \rightarrow 3 < x < 4 \rightarrow [3, 4)$
 نیمی بازه باشد $[x] \neq -1 \rightarrow -1 < x < 0 \rightarrow [-1, 0)$
 $\rightarrow \mathbb{R} - \{[-3, 4) \cup [-1, 0)\}$

الف) 
 اینها نباید باشد
 تعریف شده $\cot x \neq 0$
 تعریف شده $\tan x \neq \pm \infty$
 $\tan x \neq -1$

$\mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{4} \right\}$

ب) $\sqrt{3} \sin^2 x \leq 1 \Rightarrow \sin^2 x \leq \frac{1}{3} \Rightarrow -\frac{1}{\sqrt{3}} \leq \sin x \leq \frac{1}{\sqrt{3}} \Rightarrow k\pi - \frac{\pi}{6} \leq x \leq k\pi + \frac{\pi}{6}$
 $[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6}]$

الف) $x-1 > 0 \Rightarrow x > 1$
 II $\log_{\frac{1}{2}} x-1 < 1 \Rightarrow x-1 < \frac{1}{2} \Rightarrow x < \frac{3}{2}$
 $(1, \frac{3}{2})$

ب) I $x(x-1) > 0$

	0	1
	+	-

 $(-\infty, 0) \cup (1, +\infty)$

II $x^2-3x > 0 \Rightarrow x(x-3) > 0$

	0	3
	+	-

 $(-\infty, 0) \cup (3, +\infty) - \{3, -1\}$

III $\log_{\frac{1}{2}} x^2-3x < 1$
 $x^2-3x \neq 4 \rightarrow x^2-3x < 4 \neq 0 \Rightarrow (x-4)(x+1) \neq 0$
 $x \neq 4, x \neq -1$

الف) $\sqrt{x-x^2} > 3 \Rightarrow x^2-4x+9 < 0 \Rightarrow (x-1)(x-3) < 0$

x	1	3
P	+	-

 $(-\infty, 1) \cup (3, +\infty)$

ب) $\frac{3x+5}{2x+4} \in \mathbb{W} \Rightarrow 3x+5 = 2xW + 4W \Rightarrow x(3-2W) = 4W+5$

$x = \frac{4W+5}{3-2W}$