

$$2x^2 + y^2 - 4x + 6y + K = 0$$

$$y^2 + 6y + (2x^2 - 4x + K) = 0$$

$$\Delta' = 16 - 4(2)(K-9) = 0$$

$$16 - 8K + 72 = 0$$

$$-8K + 88 = 0$$

$$-K + 11 = 0$$

$$K = 11$$

$$\Delta = 0 = 36 - 4(1)(2x^2 - 4x + K) =$$

$$36 - 8x^2 + 16x - 4K =$$

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

$$a^2 + 4a = 2a + a + 2$$

$$a^2 + a - 2 = 0$$

$$(a+2)(a-1) = 0$$

$$a = \begin{cases} -2 \times \text{مطلوب نیست} \\ 1 \end{cases}$$

$$f_{(1)} = 1 + 4(1) = 5$$

$$|x+1| \geq 2$$

$$x+1 \geq 2, -2 \geq x+1$$

$$x \geq 1, x \leq -3$$

$$\Rightarrow f(x) = \begin{cases} 2x^2 - b & x \in [1, +\infty) \cup (-\infty, -3] \\ a + 2x & -3 \leq x \leq -1 \end{cases}$$

$$2(-3)^2 - b = a + 2(-3)$$

$$18 + 6 = a + b$$

$$a + b = 24$$

$$4x - a \geq 0$$

$$b - 3x \geq 0$$

$$4x \geq a$$

$$b \geq 3x$$

$$x \geq \frac{a}{4}$$

$$x \leq \frac{b}{3}$$

$$D = (-\infty, \frac{b}{3}] \cap [\frac{a}{4}, +\infty) = \{2\}$$

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

$$\frac{b}{3} = \frac{a}{4} = \frac{8}{4} = 2$$

$$\text{الف) } |x-3| \neq 0$$

$$x \neq 3$$

$$\frac{x+1}{|x-3|} > 0$$

$$x+1 > 0$$

$$x > -1$$

$$x^2 + 2x + 4 \neq 0$$

$$(x+1)^2 \neq 0$$

$$x \neq -1$$

$$\frac{4-x}{(x+1)^2} > 0$$

$$4-x > 0$$

$$x < 4$$

$$D = (-\infty, 4] \cap [-1, +\infty) - \{-1, 3\} = [-1, 4] - \{3\}$$

$$\text{ب) } [x] - 4 \geq 0$$

$$2 - [x] \geq 0$$

$$[x] \geq 4$$

$$[x] \leq 2$$

$$x \geq 4$$

$$x \leq 2$$

$$D = [4, +\infty) \cap (-\infty, 2) = \emptyset$$

الف) $x^3 - 13x^2 + 49x = 0$
 $(x^2 - 9)(x - 7) = 0$
 $x^2 = 9 \Rightarrow x = 3, -3$
 $x = 7$
 $x \in \{-3, -7, 7, 3\}$
 $\frac{x^2 - x - 6}{x^2 - 13x^2 + 49x} > 0$
 $\frac{(x-3)(x+2)}{(x-7)(x+7)(x-3)(x+3)} > 0$

x	-3	-2	3	7
y	+	+	-	+

$D = (-\infty, -2) \cup (2, +\infty) - \{7\}$

ب) $(x^2 - x - 6)(x-1) > 0$ $(x+3)(x-2)(x+1) = 0$
 $(x^2 + x - 6)(x+1) > 0$ $x = -3, 2, -1, 0$
 $(x-3)(x+2)(x-1) > 0$
 $(x+3)(x-2)(x+1) > 0$

x	-3	-2	-1	1	2	3
y	+	-	+	-	+	-

 $D = (-\infty, -2) \cup (-2, -1) \cup (1, 2) \cup (2, +\infty)$

الف) $[-x] - 2 > 0$ $[-x] > 2$ $-x > 2$ $x < -2$ $D = [-\infty, -2]$

ب) $[x]^2 - 2[x] - 3 = 0$
 $\Downarrow t = [x]$
 $t^2 - 2t - 3 = 0$
 $(t-3)(t+1) = 0$
 $t = 3 \Rightarrow x \in [3, 4)$
 $t = -1 \Rightarrow x \in [-1, 0)$
 $\Rightarrow D = \mathbb{R} - ([1, 2) \cup [3, 4))$

الف) $\tan x + 1 = 0$
 $\tan x = -1$
 $x = \frac{3\pi}{4}$

$D = \mathbb{R} - \{\frac{3\pi}{4}\}$

$\sin x, \cos x \neq 0$



ب) $1 - \sqrt{2} \sin x > 0$

$(1 - \sqrt{2} \sin x)(1 + \sqrt{2} \sin x) = 0$

$\sin x = \frac{1}{\sqrt{2}} \Rightarrow x = \frac{\pi}{4}$
 $\sin x = -\frac{1}{\sqrt{2}} \Rightarrow x = \frac{11\pi}{4}$

$-\frac{1}{2} \leq \sin x \leq \frac{1}{2}$

$D = \mathbb{R} - \{\frac{\pi}{6}, \frac{11\pi}{6}\}$



الف) $x-1 > 0$ $1 - \log_{\frac{1}{2}} x > 0$ $\log_{\frac{1}{2}} x \leq 1$ $x-1 \leq \frac{1}{2}$ $x \leq \frac{3}{2}$ $D = (1, \frac{3}{2}]$

ب) $x^2 - x > 0$
 $\frac{x}{x+1} > 0$
 $(-\infty, 0) \cup (1, +\infty)$

$x^2 - 3x > 0$
 $\frac{x}{x+1} > 0$
 $(-\infty, 0) \cup (3, +\infty)$

$1 - \log_{\frac{1}{2}} x^2 - 3x \neq 0$
 $\log_{\frac{1}{2}} x^2 - 3x = 1$
 $x^2 - 3x - 2 = 0$
 $\mathbb{R} - \{-1, 4\}$

$D = (-\infty, 0) \cup (3, +\infty) - \{-1, 4\}$

الف) $\sqrt{x-x^2} - 1 > 0$
 $\sqrt{x-x^2} > 1$
 $x-x^2 = 1$
 $x^2 - x + 1 = 0$
 $(x-1)(x-1) = 0$
 $x = 1$
 $D = [1, 1]$

ب) $\frac{3x+5}{2x+7} < w$

$3x+5 = 2xw+7w$

$3x-2xw = 7w-5$

$x = \frac{7w-5}{3-2w}$

$D = \{x | x = \frac{7w-5}{3-2w}, w \in \mathbb{W}\}$