

$$f(x) \leq x^2 + 2x + 1 + 9x^2 - 4x + 1 + mx^2 + nx + m = 1 - x^2 + mx^2 - 2x + nx + 2 + m$$

$$f(x) \leq -2$$

$$g(x) \in \{(1, 1), (1, P+1), (P+1, -1), (-1, P+1)\}$$

$$C \rightarrow P+1, -1 \Rightarrow P+1 \checkmark \quad C \rightarrow -1 \Rightarrow -1 + P = -2 \Rightarrow P = -1 \checkmark$$

$$m + n + P + K \leq -1 \Rightarrow (-1) + 1 \leq -1 \Rightarrow -1 \checkmark$$

$$x^2 - 2x - 1 \leq 0 \Rightarrow \frac{t+x}{-2} \cdot \frac{t^2 - 2t - 1}{t^2 - 2t - 1} = 0 \Rightarrow (t-1)(t+1) = 0$$

$$\Rightarrow t = 1 \Rightarrow x^2 - 2x - 1 = 0 \Rightarrow x = 1 \pm \sqrt{2}$$

$$D_f = (-2, +\infty) - \{1\}$$

$$1 - 2[-x] \neq 0 \Rightarrow [-x] \neq \frac{1}{2} \Rightarrow x \neq -\frac{1}{2}$$

$$-[-x] - 1 \neq 1 \Rightarrow [-x] \neq 2 \Rightarrow x \neq -2$$

$$D_f = \mathbb{R} - \{-2, -\frac{1}{2}\}$$

$$x(x^2 - 1) \geq 0 \Rightarrow \frac{-1}{-1+1-1} \rightarrow [-1, 0] \cup [1, +\infty) \quad I$$

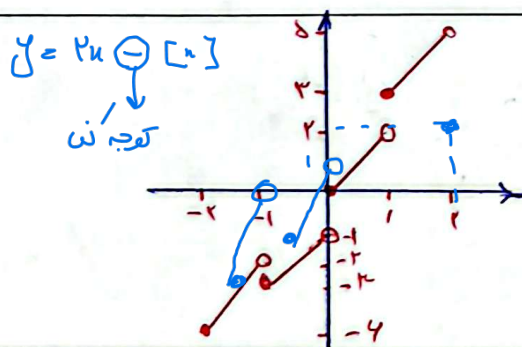
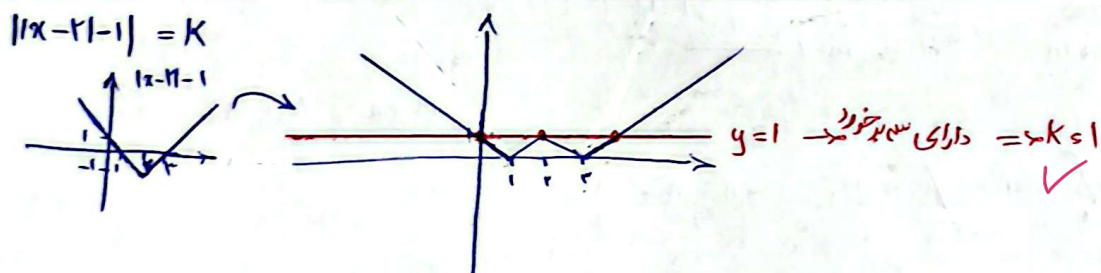
$$|x| + x \geq 0 \Rightarrow |x| \geq -x \Rightarrow x \geq 0 \Rightarrow x \geq 0 \quad II$$

$$D_f \subset I \cap II \subset [1, +\infty)$$

$$|x-1| - x^2 \geq 0 \Rightarrow |x-1| \geq x^2 \Rightarrow x-1 \geq x^2 \Rightarrow x^2 - x + 1 \leq 0$$

$$\Rightarrow x-1 \leq -x^2 \Rightarrow x^2 + x - 1 \leq 0$$

$$D_f \subset I \cap II - \{\pm 1\} = [-2, 1) - \{-1\}$$



$$[0, 1) \rightarrow f(x) = 2x$$

$$[1, 2) \rightarrow f(x) = 2x - 1$$

$$[-1, 0) \rightarrow f(x) = 2x + 1$$

$$[-2, -1) \rightarrow f(x) = 2x - 2$$

$$\frac{(x-1)(x-3)}{x+a} + b = x$$

$a < -1 \rightarrow x-3+b \leq x \Rightarrow b \leq 3 \rightarrow x-b \leq -3$
 $a \leq -3 \rightarrow x-1+b \leq x \Rightarrow b \leq 1 \rightarrow x-b \leq -1$

۲
۶

$$f(0) \leq 3 \Rightarrow g(0) \leq 3 \Rightarrow 0 + C \leq 3 \Rightarrow C \leq 3$$

$$b + C \leq \frac{1}{r} + r \leq \frac{b}{r}$$

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

$$f(1) \leq \frac{a+r}{1+b} = 3 \Rightarrow 3b = a-1$$

$b = r \Rightarrow b \leq \frac{1}{r}$

۲
۷

$$r\sqrt{c-3a} + (x-2)\sqrt{b-c} - 3x = x$$

$$r\sqrt{c-3a} - \sqrt{b-c} - 2 \leq 2x$$

$$-2 \leq 2x \leq 2, x \leq -1$$

$$3a - \frac{b}{r} - 2 \leq c - 2 + 1 = 3$$

$Df \cap Dg = \{1\}$
 $x \geq 3a, x \leq b$
 $x \geq \frac{3a}{r}, x \leq \frac{b}{r}$
 $[\frac{3a}{r}, \frac{b}{r}] = \{1\}$
 $a \leq \frac{r}{3}, b \leq r$

۲
۸

$$x \geq -2 \Rightarrow x \geq -1$$

$$x \leq m$$

$$Dg$$

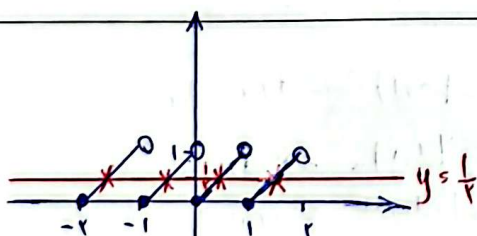
$$Df \cap Dg \in [-1, 7]$$

$$m = 7$$

$$\sqrt{x} + n - \sqrt{x} = 4\sqrt{x} \Rightarrow n \leq 4\sqrt{x} - 2$$

$$m+n = 4\sqrt{x} - 2 + 7 = 4\sqrt{x} - 5$$

۲
۹



بازه بندی ها را بنویس

۴ جابجی دارد

$$\begin{cases}
 0 \leq x < 1 \rightarrow n \\
 1 \leq x < 2 \rightarrow n-1 \\
 2 \leq x < 3 \rightarrow n-2 \\
 3 \leq x < 4 \rightarrow n-1 \\
 4 \leq x < 5 \rightarrow n+1
 \end{cases}$$

۲
۱۰