

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

$$\begin{aligned} 1+m &= 0 \rightarrow m = -1 \\ n-4 &= 0 \rightarrow n = 4 \end{aligned} \quad \rightarrow f(x) = 2 - 4 = -2 \quad g(x) = \{(4, -1), (4, p+1), (p+2, -1), (-9, p+k)\}$$

$$\Rightarrow m+n+p+k = -1+4-1+1 = -1 \quad \rightarrow k = 1$$

$$\text{الف) } \frac{x-2}{x^2-2x^2-1} > 0 \rightarrow \frac{x-2}{(x^2-4)(x^2+1)} \geq 0 \quad \rightarrow 4-2[x] \neq 0 \rightarrow 4 \neq 2[x]$$

$$\rightarrow \frac{x-2}{(x-2)(x+2)(x^2+1)} \rightarrow -\frac{1}{x+2} + \frac{1}{x^2+1} \quad \rightarrow 2 \neq [x] \rightarrow x \notin [2, 3]$$

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

$$\text{الف) } x(x^2-1) > 0 \rightarrow \frac{-1 \cdot 0 \cdot 1}{-\infty + \infty - \infty + \infty} \rightarrow [-1, 0] \cup [1, +\infty)$$

$$\rightarrow |x| + x > 0 \rightarrow \begin{cases} 2x & x > 0 \\ 0 & x = 0 \\ 0 & x < 0 \end{cases} \rightarrow (0, +\infty) \quad \rightarrow |x-2| > x^2 \rightarrow [-2, 1]$$

$$\rightarrow |x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1 \quad \Rightarrow D_f = [-2, 1] - \{-1\}$$

$$\rightarrow ||x-2|-1| = k \quad (k > 0) \quad \rightarrow |x-2|-k = k \rightarrow |x-2| = k+1 \rightarrow x-2 = k+1 \rightarrow x = k+3$$

$$\text{I) } (k > -1) \rightarrow 2-x = k+1 \rightarrow x = 1-k$$

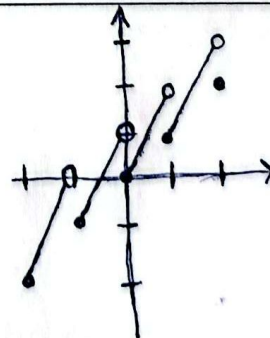
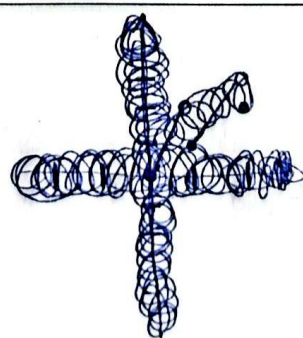
$$\rightarrow |x-2|-1 = -k \rightarrow |x-2| = 1-k \rightarrow x-2 = 1-k \rightarrow x = 3-k$$

$$\text{II) } (1 > k) \rightarrow 2-x = 1-k \rightarrow x = k+1$$

$$\text{III) } (1 > k) \rightarrow 2-x = 1-k \rightarrow x = k+1$$

$$\text{I \cap II \cap III} \rightarrow 0 \leq k \leq 1 \quad \rightarrow k=1 \rightarrow x=4, 2, 0 \quad \checkmark \quad k=0 \rightarrow x=1, 3 \quad \checkmark$$

$$y = \begin{cases} 2x+2 & -2 \leq x < -1 \\ 2x+1 & -1 \leq x < 0 \\ 2x & 0 \leq x < 1 \\ 2x-1 & 1 \leq x < 2 \\ 2 & x=2 \end{cases}$$



$$\rightarrow \frac{x^2 - 4x + 3 + bx + ab}{x+a} = \frac{x^2 + (b-4)x + 3+ab}{x+a} \rightarrow 3+ab=0$$

$$\rightarrow \frac{x(x+b-4)}{x+a} \rightarrow (x+b-4)=(x+a) \rightarrow a=b-4 \rightarrow b(b-4)=-3 \rightarrow b=1, 3$$

$$S = \{-4\} \leftarrow \begin{matrix} a_1 - b_1 = -3 - 1 = -4 \\ a_2 - b_2 = -1 - 3 = -4 \end{matrix} \leftarrow \begin{matrix} a = -3, -1 \end{matrix}$$

$$\rightarrow \frac{x^2(x+1) - (x+1)}{x^2-1} = \frac{(x^2-1)(x+1)}{x^2-1} = x+1 \rightarrow C=2$$

$$\begin{matrix} x=1 \rightarrow \frac{a+2}{b+1} = 2 \rightarrow a+2=2b+2 \\ x=-1 \rightarrow \frac{-a+2}{b-1} = 1 \rightarrow -a+2=b-1 \end{matrix}$$

$$\oplus \rightarrow 2 = 2b+2 \rightarrow b=0$$

$$b+c = 2 + \frac{1}{2} = \frac{5}{2}$$

$$D_{f \circ g} = D_{f \circ g} = [1, 7] \rightarrow x=3 \rightarrow \sqrt{m-3} + n - \sqrt{(3)+2} = 6\sqrt{2}$$

$$\rightarrow \sqrt{m-3} + n = 8\sqrt{2} \rightarrow \sqrt{m-3} = 8\sqrt{2} - n \rightarrow m-3 = 128$$

سوال 9

$$n=0 \Rightarrow m+n=131+0=131 \leftarrow m=131$$

$$g(x) \rightarrow b-4x \geq 0 \rightarrow \frac{b}{4} \geq x$$

$$f(x) \rightarrow 4x-3a \geq 0 \rightarrow x \geq \frac{3}{4}a$$

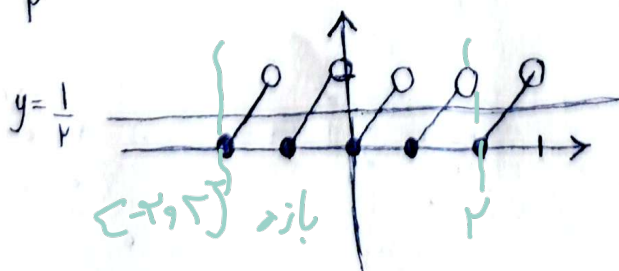
$$D_f \cap D_g = \{x\} \rightarrow \frac{b}{4} = \frac{3}{4}a = 1 \rightarrow \begin{matrix} b=4 \\ a=\frac{4}{3} \end{matrix}$$

سوال 8

$$2f-g \xrightarrow{x=1} 2(\sqrt{4-4} + k-1) - (\sqrt{4-4} + 3k) = 2k-2-3k = -k-2 = k \rightarrow k=-1$$

$$\rightarrow 3a - \frac{b}{4} - k = 4-2+1 = 3 \rightarrow \text{جواب 3}$$

$$\rightarrow y = x - [x] = \frac{1}{2}$$



مقدار 1/2

جواب 2