

① ②

$$f(x) = x^2 + 2x + 1 + 9x^2 - 4x + 1 + mx^2 + nx + mn$$

$$1 \cdot x^2 + mx^2 = 0 \Rightarrow m = -1 \quad -4x + nx = 0 \Rightarrow n = 4$$

$$g(x) = \{(x, -1), (x, p+1), (p+1, -1), (-1, p+1)\} \Rightarrow p+1 = 1 \Rightarrow p = -1$$

$$p+1 = -1 \Rightarrow p = -2$$

$$m+n+p+k = -1 + 4 + (-1) + 1 = -1 \quad \checkmark$$

الف) $x-2=0 \Rightarrow x=2$ $x^2 - 4x + 4 = 0 \Rightarrow (x-2)(x-2) = 0 \Rightarrow x^2 - 4x + 4 = 0 \Rightarrow x^2 = 4 \Rightarrow x = \pm 2$ ① ②

مخرج را صفر می‌کنیم، در دامنه جستجو! $\Rightarrow P_f = (-2, +\infty)$

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

$\Rightarrow 4-2[-x] \neq 0 \Rightarrow [-x] \neq 2 \Rightarrow 2 \leq -x < 4 \Rightarrow -x \geq -4 \Rightarrow x \leq 4$

$\Rightarrow P_f = R - [-2, 2]$ ✓

الف) $x(x^2-1) \geq 0$ $\frac{-1}{-} \frac{0}{+} \frac{1}{+}$ $|x| + x > 0$ ① ②

$\hookrightarrow [-1, 0] \cup [1, +\infty)$ $P_f = \emptyset \cap P = [1, +\infty)$

$R^- \Rightarrow 0$
 $0 \Rightarrow 0$
 $R^+ \Rightarrow x$

ب) $|x-2| - x^2 > 0$

$x-2-x^2 > 0 \Rightarrow x^2+x-2 \leq 0 \Rightarrow (x+2)(x-1) \leq 0$

$\frac{-2}{+} \frac{1}{-}$

$\Rightarrow [-2, 1]$ ① ②

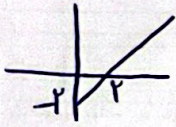
چون از 2 بزرگتر است

$|x|-1=0 \Rightarrow |x| \neq 1 \Rightarrow x \neq \pm 1$ $\Rightarrow P_f = \emptyset \cap P = [-1, 1) - \{-1\}$ ✓

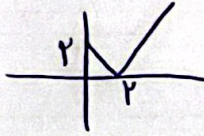
ساختار

$$||x-2|-1|-k \neq 0$$

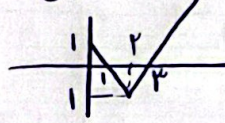
۲: ①



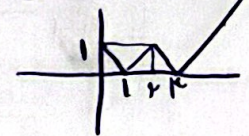
②



③



④



⑤ عند این کسر
||x+1|-1|-k

این نمودار را باید که واحد یاسن کنیم به طوری که نقطه از روی نمودار روی خط باشد نه بیرون آن
مثال $k=1$ ✓

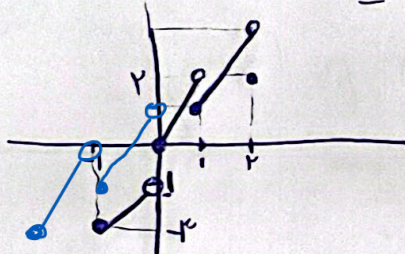
$$x=2 \Rightarrow 2x-2$$

$$0 \leq x < 1 \Rightarrow 2x$$

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

$$1 \leq x < 2 \Rightarrow 2x-1$$

$$-1 \leq x < 0 \Rightarrow 2x-1$$



⑤ ۱, ۵

$$f(x) = x \Rightarrow y = x$$

$$f(x) = \frac{x^2 - 2x + 1 + b}{x + a}$$

اگر $a < -1 \rightarrow x - 2 + b = x \rightarrow b = 2$
اگر $a < -2 \rightarrow x - 1 + b = x \rightarrow b = 1$

$$(x+a)(x-b) = x^2 - 2x + 1 \Rightarrow x^2 + (a-b)x - ab = x^2 - 2x + 1$$

$$\boxed{a-b=-2}$$

$$\boxed{ab=-1}$$

⑤ ۲

⑤ ۲

$$x=1 \Rightarrow \frac{a+1}{b+1} = c+1 \Rightarrow \frac{a+1}{b+1} = c+1$$

$$\Rightarrow 1 - 2 + 1 = a + 1$$

$$x=2 \Rightarrow \frac{2^2 - 2 \times 2 + 1 - 2}{2^2 - 1} = \frac{1}{1} = 1 = 2 + c \Rightarrow c = -1$$

$$x=-1 \Rightarrow \frac{1-a}{b-1} = c-1 \Rightarrow b-1 = 1-a \Rightarrow b = 2-a$$

$$b+c = \frac{1}{2} + 1 = \frac{3}{2}$$

$$x=1 \Rightarrow 1f = 1\sqrt{f-a} + 1k-1$$

$$\Rightarrow g = \sqrt{b-a} + 1k$$

① 1, 10

~~تفاوت بین دو عبارت~~

تفاوت بین دو عبارت = 1 : 05

$$D_f \cap D_g = \{1\} \Rightarrow$$

$$\left. \begin{array}{l} D_f : f-a > 0 \Rightarrow x > \frac{a}{f} \\ D_g : b-a > 0 \Rightarrow x < \frac{b}{f} \end{array} \right\} \rightarrow \frac{a}{f} = \frac{b}{f} \Rightarrow a=b$$

$$1f - g = 1\sqrt{f-b} + 1k-1 - \sqrt{b-f} - 1k = k$$

$$\Rightarrow 1\sqrt{f-b} - \sqrt{b-f} = 1k+1$$

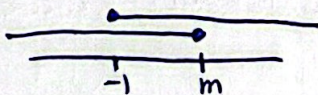
$$\left. \begin{array}{l} \downarrow \quad \downarrow \\ b \leq f, b \geq f \Rightarrow b=f \end{array} \right\}$$

$$\Rightarrow 1k+1=0 \Rightarrow k=-1$$

$$a=b \Rightarrow a = \frac{f}{f}$$

$$a - \frac{b}{f} - k = f-1-1 = 0 \quad f-1-(-1) = 0$$

$$D_{f \cap g} = D_f \cap D_g = [-1, 1]$$



$$D_f : m-a > 0 \Rightarrow x \leq m$$

$$D_g : 1a+1 > 0 \Rightarrow x > -1$$

$$\Rightarrow m=1$$

$$f(1) - g(1) = \sqrt{2} \Rightarrow 1+n - 1\sqrt{2} = \sqrt{2} \Rightarrow n = \sqrt{2} - 1$$

$$m+n = 1 + \sqrt{2} - 1 = \sqrt{2}$$

$$x=1 \Rightarrow x-1 = \frac{1}{f} \Rightarrow x = \frac{1}{f} + 1$$

$$1 \leq x < 2 \Rightarrow x-1 = \frac{1}{f} \Rightarrow x = \frac{1}{f} + 1$$

$$0 \leq x < 1 \Rightarrow x = \frac{1}{f} \quad -1 \leq x < 0 \Rightarrow x+1 = \frac{1}{f} \Rightarrow x = \frac{1}{f} - 1$$