

$$f(x) = x^2 + 2x + 1 + 9x^2 - 2x + 1 + mn + mx^2 + nx \Rightarrow (m+10)x^2 + (n-4)x + nm+2$$

ثبت f

$$m+10=0 \Rightarrow m=-10, \quad n-4=0 \Rightarrow n=4$$

$$g(x) = \{(4, -10), (4, p+1), (p+2, -1), (1-9, p+k)\}$$

$$\rightarrow p+1=-10 \rightarrow p=-11 \Rightarrow p+2=-9 \rightarrow -11+k=-1 \Rightarrow k=10$$

$$\left. \begin{array}{l} m+n+p+k \\ -10+4-11+10 = -7 \end{array} \right\} \text{ } \quad \text{2}$$

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

$$x^2-2x-1 \neq 0 \rightarrow [-x]+2$$

$$\rightarrow -x \notin [2, 3) \rightarrow x \notin (-3, -2]$$

$$D_f = R = (-3, -2]$$

الف) $y = \sqrt{\frac{x-2}{x^2-2x-1}}$ $x=2$

$x = \pm 2 \Rightarrow \frac{x-2}{x^2-2x-1}$

$\frac{x}{p} \mid \begin{array}{ccc} -2 & 2 & +2 \\ - & + & - \end{array}$

$\rightarrow D_f = (-2, 2] \cup (2, +\infty)$

$$f(x) = \frac{\sqrt{|x-1|-x^2}}{|x|-1}$$

$$I \rightarrow |x-1|-x^2 > 0 \Rightarrow \begin{cases} x > 2 \rightarrow x-2-x^2 \\ x \leq 2 \rightarrow -x+2-x^2 \end{cases}$$

$$x^2-x+2 \leq 0 \rightarrow \Delta < 0 \rightarrow \emptyset$$

$$x^2+x-2 \leq 0 \rightarrow \frac{-1 \pm \sqrt{1+8}}{2} \rightarrow [-2, 1]$$

$$\rightarrow x = -2$$

$$\Rightarrow D_f = [-2]$$

الف) $f(x) = \frac{\sqrt{x(x^2-1)}}{\sqrt{|x|+x}}$

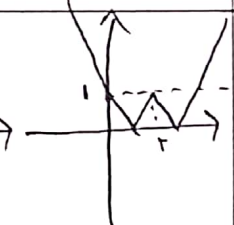
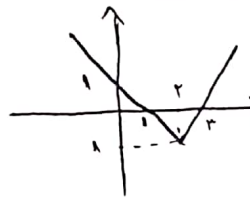
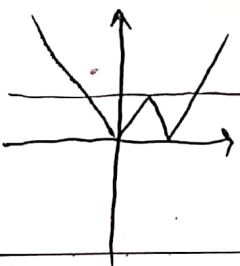
$I \rightarrow x(x^2-1) > 0 \rightarrow \frac{x}{p} \mid \begin{array}{ccc} -1 & 0 & 1 \\ - & + & - \end{array}$

$x \in [-1, 0] \cup [1, +\infty)$

$II \rightarrow |x|+x > 0 \rightarrow \begin{cases} x > 0 \rightarrow 2x \checkmark \\ x \leq 0 \rightarrow 0 \end{cases}$

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

$$||x-2|-1| = K$$



با $y=1$ و $x=1$ و $x=3$ $\Rightarrow K=1$

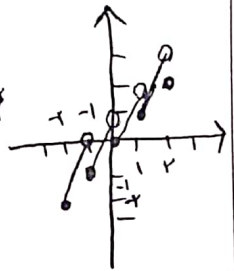
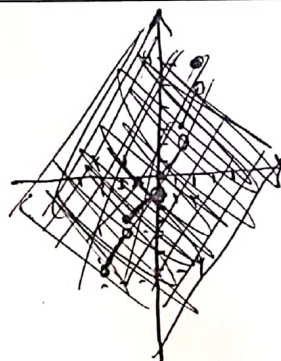
$$y = 2n - [x]$$

$$[-2, -1) \rightarrow 2n+2 \quad x=2 \rightarrow 2$$

$$[-1, 0) \rightarrow 2n+1$$

$$[0, 1) \rightarrow 2n$$

$$[1, 2) \rightarrow 2n-1$$



$$f(x) = \frac{(x-r)(x-1)}{x+a} + b \quad \begin{array}{l} \textcircled{1} \rightarrow x+a = x-r \rightarrow a = -r \\ \rightarrow x-1+b = x \rightarrow b = 1 \\ \textcircled{2} \rightarrow x+a = x-1 \quad a = -1 \\ \Rightarrow x-r+b = x \Rightarrow b = r \end{array}$$

$$(a, b) = \{(-r, 1), (-1, r)\}$$

$$x \neq \pm 1 \rightarrow f(x) = x+r = g(x) \rightarrow C=r$$

$$x = \pm 1 \rightarrow f(x) = \frac{ax+r}{x+b} = g(x) \Rightarrow b+C = r + \frac{1}{r} = \frac{r^2+1}{r}$$

$$\begin{array}{l} x=1 \rightarrow g(x)=r \Rightarrow \frac{a+r}{b+1} = r \Rightarrow a+r = rb+r \rightarrow a-rb=1 \\ x=-1 \Rightarrow g(x)=1 \Rightarrow \frac{-a+r}{b-1} = 1 \Rightarrow -a+r = b-1 \rightarrow -a-b = -r \end{array} \rightarrow b = \frac{1}{r}$$

$$\begin{array}{l} D_f \Rightarrow f(x-r) \geq 0 \Rightarrow x \geq \frac{ra}{f} \quad D_r f \cdot g = D_f \cap g = \frac{r}{f} \leq x \leq \frac{b}{f} \\ D_g \Rightarrow b-fx \geq 0 \Rightarrow \frac{b}{f} \geq x \quad = D_f \cap g = \{1\} \quad x=1 \quad \frac{b}{f}=1 \\ \Rightarrow b=f \\ ra - \frac{b}{f} - K = f-r+1=r \quad R_r f \cdot g = rK-r-rK = K = -r-K=K \\ \Rightarrow K=-1 \end{array}$$

$$D_{f \cdot g} = D_f \cap D_g \rightarrow D_g = [-1, +\infty) \Rightarrow D_f = (-\infty, 1] \rightarrow m=1$$

$$f \cdot g(x) = 4\sqrt{x} \rightarrow \sqrt{x} + n - r\sqrt{x} = 4\sqrt{x} \quad n = 1\sqrt{x} - r$$

$$\rightarrow m+n = 1\sqrt{x} + a$$

$$y = (1)(x - [x]) = \frac{1}{x}$$

$$x \in [-r, -1) \Rightarrow x+r$$

$$x \in [-1, 0) \Rightarrow x+1$$

$$x \in [0, 1) \Rightarrow x$$

$$x \in [1, r) \Rightarrow x-1$$

$$x=r \Rightarrow 0$$

