

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

$$f(x) = \underbrace{x^2 + 2x + 1 + x^2 - 2x + 1}_{10x^2} + mn^2 + nx + mn = (1+m)x^2 + (n-\varepsilon)x + 2mn$$

$$\begin{aligned} \rightarrow 1+m &= 0 \rightarrow m = -1 \\ \rightarrow n-\varepsilon &= 0 \rightarrow n = \varepsilon \end{aligned} \rightarrow mn = -\varepsilon$$

$$g(x) = \{(\varepsilon, m), (n, p+1), (p+2, -1), (-1, p+k)\} = \{(\varepsilon, -1), (\varepsilon, p+1), (p+2, -1), (-1, p+k)\}$$

$$\rightarrow p+1 = -1 \rightarrow p = -2 \rightarrow p+2 = -1 \rightarrow (p+2, -1) = (-1, -1)$$

$$\rightarrow p+k = -1 \rightarrow -2+k = -1 \rightarrow k = 1$$

$$m+n+p+k = -1 + \varepsilon - 2 + 1 = -\varepsilon$$

$$x^2 - 2x - 1 \neq 0 \xrightarrow{x=t} t^2 - 2t - 1 = 0 \rightarrow t = -2 \text{ or } t = 2$$

$$y \geq 0$$

$$\begin{array}{r} -2 \quad 2 \\ \hline -\frac{1}{2} + \frac{1}{2} \end{array}$$

$$x-2=0 \rightarrow x=2$$

$$D_f = (-5, \infty) - \{2\}$$

$$\varepsilon - 2[-x] \neq 0 \rightarrow -2[-x] \neq -\varepsilon \rightarrow [-x] \neq 2$$

$$[-x] = 2 \rightarrow 2 \leq -x < 3 \rightarrow -2 < x \leq -1$$

$$D_f = (-5, -1] \cup (-1, -2]$$

$$\text{الف } x(x^2-1) \geq 0 \quad \begin{array}{c} -1 \quad 0 \quad 1 \\ \hline - \quad + \quad - \quad + \end{array} \quad 1$$

$$x+|x| > 0 \rightarrow x+|x| \neq 0 \rightarrow |x| \neq -x \rightarrow x > 0$$

هست و است
بهر صورت

$$D_f, 1 \cap 2 = [0, \infty)$$

$$|x|-1 \neq 0 \rightarrow |x| \neq 1 \rightarrow x \neq \pm 1 \quad (1)$$

$$|x-1| - x^2 \geq 0$$

$$\frac{-x^2 - x + 1 \geq 0}{\alpha} \quad | \quad -x^2 + x - 1 \geq 0$$

$$D_{f, \mathbb{Q}} \cap \mathbb{Q} = (-1, 1] - \{1\} \quad (2)$$

$$|x-1| - 1 \neq k \rightarrow |x-1| - 1 \neq k \rightarrow |x-1| \neq k+1$$

(3)

$$\begin{cases} x-1 \neq k-1 \\ x-1 \neq k+1 \\ x-1 \neq -k+1 \\ x-1 \neq -k-1 \end{cases}$$

test 1

$$\begin{cases} x-1 \neq -k+1 \\ x-1 \neq k+1 \\ x-1 \neq -k-1 \\ x-1 \neq k-1 \end{cases}$$

$$k+1 = -k-1 \rightarrow k = -1 \quad \alpha$$

$$k+1 = -k+1 \rightarrow k = 0 \quad \checkmark$$

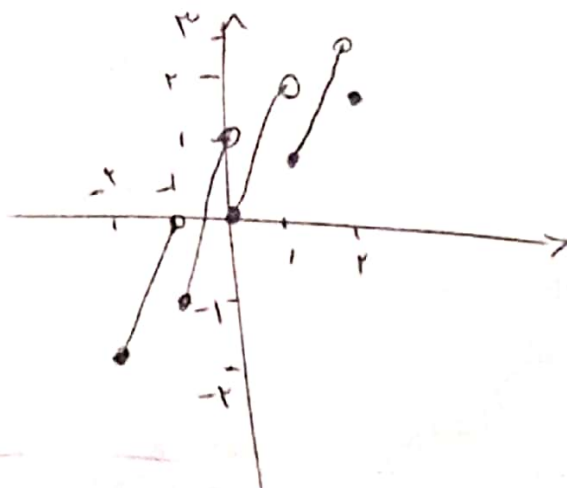
$$-1 \leq x < -1 \rightarrow [x] = -1 \rightarrow y = 2x + 1$$

$$-1 \leq x < 0 \rightarrow [x] = -1 \rightarrow y = 2x + 1$$

$$0 \leq x < 1 \rightarrow [x] = 0 \rightarrow y = 2x$$

$$1 \leq x < 2 \rightarrow [x] = 1 \rightarrow y = 2x - 1$$

$$x = 2 \rightarrow [x] = 2 \rightarrow y = 2$$



(4)

$$\frac{x^2 - \varepsilon x + r}{x+a} + b = x \rightarrow \frac{x^2 - \varepsilon x + r}{x+a} = (x-b)$$

(5)

$$x^2 - \varepsilon x + r = (x+a)(x-b) = x^2 + (a-b)x - ab \rightarrow a-b = -\varepsilon$$

$$\frac{n^r - rn^r - n - r}{n^r - 1} \Rightarrow \frac{(n+1)(n-1)(n+r)}{(n+1)(n-1)} = n+r$$

$n \neq \pm 1$

(V)

$$n+c = n+r \rightarrow c=r$$

$$\frac{an+r}{n+b} = n+r \rightarrow \begin{matrix} n=1 & \frac{a+r}{b+1} = r \rightarrow a+r = rb+r \\ n=\pm 1 & \searrow \\ n=-1 & \frac{-a+r}{b-1} = 1 \rightarrow -a+r = b-1 \end{matrix}$$

$$\left. \begin{matrix} a = \frac{a}{r} \\ b = \frac{1}{r} \end{matrix} \right\}$$

$$b+c = \frac{1}{r} + r = \frac{a}{r}$$

$$rf - g(1) = k$$

$$a=1 \text{ مقدار } f \rightarrow D_f : n \geq \frac{ra}{\varepsilon}$$

دایره کوچک دارد

$$\rightarrow D_g = b \geq \varepsilon n \rightarrow n \leq \frac{b}{\varepsilon}$$

$$\rightarrow \frac{ra}{\varepsilon} = \frac{b}{\varepsilon} \rightarrow ra = b$$

(1)

$$\frac{ra}{\varepsilon} = \frac{b}{\varepsilon} = 1 \rightarrow b = \varepsilon \rightarrow a = \frac{\varepsilon}{r}$$

$$rf - g(1) = r\sqrt{\varepsilon} + rk - r - \sqrt{\varepsilon - \varepsilon} \rightarrow rk = k$$

$$\rightarrow rk = -r \rightarrow k = -1$$

$$ra - \frac{b}{r} - k = \varepsilon - r + 1 = r$$

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

(9)

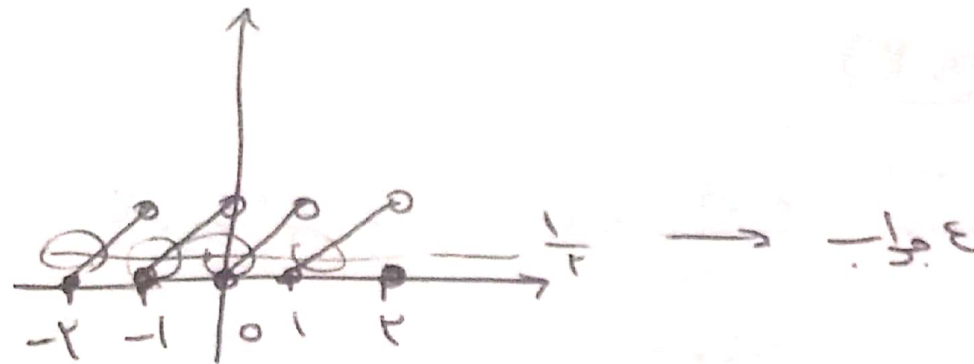
$$D_g = m+r \geq 0 \rightarrow m \geq -r \rightarrow D_f : m \leq \sqrt{r} \rightarrow m = \sqrt{r}$$

$$f - g(r) = r+m - r\sqrt{r} = 4\sqrt{r} \rightarrow n = 4\sqrt{r} - r$$

$$m+n = 4\sqrt{r} - r + \sqrt{r} = 5\sqrt{r} - r$$

$$y = (x - [x])$$

$$y = \frac{1}{T}$$



(1.)