

(۱)

$$2x^2 + y^2 - 4x + 6y + k = 0$$

$$\xrightarrow{\text{فرض کنید}} (\sqrt{2}x - \sqrt{2})^2 + (y + 3)^2 = 0 \rightarrow 2x^2 + 2 - 4x + y^2 + 6y + 9 = 0$$

$$\rightarrow k = 2 + 9 = 11$$

$$f(x) = \begin{cases} x^2 + 4x & ; x \geq a \\ 2x + a + 2 & ; x \leq a \end{cases} \rightarrow a = 1 \Rightarrow f(1) = (1)^2 + 4(1) = 5$$

(۲)

$$a = k \rightarrow a^2 + 4a = 2a + 2 \rightarrow a^2 + a - 2 = 0 \rightarrow (a - 1)(a + 2) = 0$$

$$a \begin{cases} 1 \\ -2 \end{cases} \text{ غرض } a \geq 0$$

$$f(x) = \begin{cases} 2x^2 - b & ; |x+1| \geq 2 \\ a + 2x & ; -2 \leq x \leq -1 \end{cases} \rightarrow \begin{cases} x+1 \geq 2 \rightarrow x \geq 1 \\ -x-1 \geq 2 \rightarrow -x \geq 3 \rightarrow x \leq -3 \end{cases}$$

(۳)

$$x = -3 \rightarrow 2(-3)^2 - b = a + 2(-3) \rightarrow 18 - b = a - 6 \rightarrow 24 = a + b$$

$$y = \sqrt{4x - a} + \sqrt{b - 2x} \quad x = 2 \rightarrow y = \sqrt{8 - a} + \sqrt{b - 4}$$

$$D_f = \{2\} \Rightarrow a = 12, b = 6$$

(۴)

$$y = \sqrt{\frac{x+1}{|x-2|}} + \sqrt{\frac{y-x}{x^2+2x+4}} \rightarrow y$$

اولی مثبت
دومی، هفتم مثبت

$$\begin{array}{c} \text{I} \quad \frac{-1}{-} \frac{2}{+} \frac{3}{+} \\ \hline \text{II} \quad \frac{2}{+} \frac{4}{-} \end{array} \rightarrow D_f = [-1, 4] - \{2\}$$

(۵)

$$\text{ب) } y = \sqrt{[x] - 4} + \sqrt{2 - [x]}$$

$$[x] - 4 \geq 0 \rightarrow [x] \geq 4 \rightarrow x \geq 4 \quad \text{I}$$

$$2 - [x] \geq 0 \rightarrow [x] \leq 2 \rightarrow x \leq 2 \quad \text{II}$$

$$I \cap II = \emptyset \Rightarrow D_f = \emptyset$$

$$\text{الف) } y = \sqrt{\frac{x^2 - x - 6}{x^2 - 12x^2 + 36}} \rightarrow (x-3)(x+2)$$

$$(x^2 - 9)(x^2 - 4) \rightarrow (x-3)(x+3)(x-2)(x+2)$$

$$\frac{-3 \quad -2 \quad 2 \quad 3}{+ \quad - \quad - \quad +}$$

$$D_f = (-\infty, -3) \cup (2, +\infty) - \{3\}$$

$$\text{ب) } y = \sqrt{\frac{x^2 - 2x^2 - 5x + 6}{x^2 + 2x^2 - 4x - 1}}$$

مخرج صفر

$$= (x-1) \rightarrow (x-1)(x^2 - x - 6) \rightarrow (x-1)(x-3)(x+2)$$

$$\rightarrow (x+1) \rightarrow (x+1)(x^2 + x - 2) \rightarrow (x+1)(x+2)(x-1)$$

$$\frac{-3 \quad -2 \quad -1 \quad 1 \quad 2 \quad 3}{+ \quad - \quad + \quad - \quad + \quad -}$$

$$D_f = (-\infty, -3) \cup [2, -1) \cup [1, 2) \cup [3, +\infty)$$

$$\text{الف) } y = \sqrt{[x] - 2}$$

$$[x] - 2 \geq 0 \rightarrow [x] \geq 2 \rightarrow x \leq -2$$

$$\rightarrow [x \leq -2]$$

$$D_f = (-\infty, -2]$$

$$\text{ب) } y = \frac{5x^2 + 6}{[x]^2 - 2[x] - 3}$$

$$[x]^2 - 2[x] - 3 \neq 0 \rightarrow ([x] - 3)([x] + 1) \neq 0$$

$$[x] \neq 3 \rightarrow x \notin [3, 4)$$

$$[x] \neq -1 \rightarrow x \notin [-1, 0)$$

$$D_f = \mathbb{R} - [-1, 0) \cup [3, 4)$$

$$\text{الف) } y = \frac{\cot x + 1}{\tan x + 1}$$

$$\sin x \neq 0 \rightarrow x \neq \{k\pi\}$$

$$\cos x \neq 0 \Rightarrow x \neq \{k\pi + \frac{\pi}{2}\}$$

$$\tan x \neq -1 \Rightarrow x \neq \{k\pi + \frac{3\pi}{4}\}$$

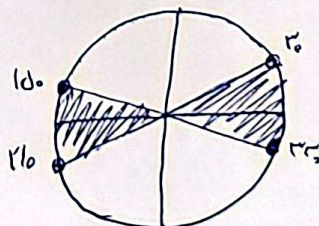
$$D_f = \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi + \frac{3\pi}{4} \right\}$$

$$\text{ب) } y = \sqrt{1 - 5 \sin x}$$

$$1 - 5 \sin x \geq 0 \rightarrow 5 \sin x \leq 1$$

$$\sin x \leq \frac{1}{5}$$

$$-\frac{1}{5} \leq \sin x \leq \frac{1}{5}$$



$$D_f = \left[k\pi - \frac{\pi}{5}, k\pi + \frac{\pi}{5} \right]$$

بازارم بر

معین نصری

تلفن شماره ۲

(9)

$$y = \sqrt{1 - \log^{\frac{1}{r}}(x-1)} \quad \rightarrow \quad 1 - \log^{\frac{1}{r}}(x-1) \geq 0 \quad \log^{\frac{1}{r}}(x-1) \leq 1 \quad \star \quad x-1 \geq \frac{1}{r}$$

$$D_f = \left[\frac{1}{r}, +\infty\right)$$

$$\star \quad \text{If } \log_b a > c \quad \frac{a < b^c}{\text{مثلاً } \log_2 8 > 3 \Rightarrow 8 < 2^3}$$

$$\text{ب) } y = \frac{\sqrt{x^r - x}}{1 - \log^{\frac{1}{r}}(x^r - x)}$$

$$x(x-1) > 0$$

$$\frac{0}{+} \quad \frac{1}{-} \quad \frac{+}{+} \quad \text{I} \quad x = (-\infty, 0] \cup [1, +\infty)$$

$$x^r - rx > 0 \rightarrow x(x-r) > 0$$

$$\frac{0}{+} \quad \frac{r}{-} \quad \frac{+}{+} \quad \text{II} \quad x = (-\infty, 0) \cup (r, +\infty)$$

$$1 - \log^{\frac{1}{r}}(x^r - rx) \neq 0 \rightarrow \log^{\frac{1}{r}}(x^r - rx) \neq 1 \rightarrow x^r - rx \neq r \rightarrow x^r - rx - r \neq 0$$

$$I \cap II \cap III = (-\infty, 0) \cup (r, +\infty) - \{r, -1\} = D_f$$

$$(x-r)(x+1) = 0$$

$$x \neq r, -1 \quad \text{III}$$

$$\text{الف) } y = \sqrt{r^{rx-x^r} - 1} \quad \rightarrow \quad r^{rx-x^r} - 1 \geq 0 \quad \rightarrow \quad r^{rx-x^r} \geq 1$$

$$rx - x^r \geq 0 \quad (x-r)(x-1) \geq 0$$

$$\rightarrow x^r - rx + r \leq 0$$

$$\frac{1}{+} \quad \frac{r}{-} \quad \frac{+}{+}$$

$$D_f = [1, r]$$

(10)

$$\text{ب) } y = \left(\frac{rx + \omega}{rx + \varepsilon}\right)! \rightarrow \frac{rx + \omega}{rx + \varepsilon} \in \mathbb{W}$$

$$x \in -\frac{\varepsilon\mathbb{W} - \omega}{r\mathbb{W} - r} \rightarrow x \in \frac{-\varepsilon\mathbb{W} + \omega}{r\mathbb{W} - r}$$

$$\Rightarrow D_f = \left\{x \mid x = \frac{\omega - \varepsilon k}{rk - r}, k \in \mathbb{W}\right\}$$