

$$f(x) = \sqrt{(a-1)x^2 + ax + b} \rightarrow \text{باید } \rightarrow a-2=0 \rightarrow \underline{a=2}$$

$$2x+b \rightarrow 2(1)+b=0 \rightarrow \underline{b=-2}$$

$$D_f = [1, +\infty) \leftarrow \text{دارد مثال}$$

$$f(x) = \sqrt{x^2 + 2x + 2 - m^2} \rightarrow x^2 + 2x + 2 = (x+1)^2 + 1$$

$$\Rightarrow 1 - m^2 \geq 0 \rightarrow m^2 \leq 1$$

$$-1 \leq m \leq 1 \rightarrow 1 - (-1) = \underline{2}$$

$$f(x) = \frac{\sqrt{4-x^2}}{[x] + [-x] + 1} \quad 4-x^2 \geq 0 \rightarrow x^2 \leq 4 \rightarrow -2 \leq x \leq 2$$

همه اعداد صحیح بین -2 و 2 در دامنه هستند
 $-2, -1, 0, 1, 2 \Rightarrow \underline{\text{اعداد صحیح}}$

$$y = \sqrt{x^3 + 3x^2} \rightarrow x^3 + 3x^2 \geq 0 \rightarrow x^2(x+3) \geq 0 \rightarrow x+3 \geq 0 \rightarrow \underline{D_f = [-3, +\infty)}$$

$$y = \sqrt{\frac{(x^2-1)(x^2-3x^2)}{x^2-1}} \quad \frac{(x^2-1)(x^2-3x^2)}{x^2-1} \geq 0 \quad \begin{matrix} x^2-1 = (x-1)(x+1) \\ x^2-3x^2 = x^2(x-3) \end{matrix} \quad \begin{matrix} x^2-1 = (x-1)(x^2+x+1) \\ x^2-3x^2 = x^2(x-3) \end{matrix}$$

$$\frac{(x-1)(x+1)x^2(x-3)}{(x-1)(x^2+x+1)} \rightarrow \frac{x^2(x+1)(x-3)}{x^2+x+1} \geq 0 \quad \underline{D_f = (-\infty, -1] \cup \{0\} \cup [3, +\infty)}$$

$$y = \sqrt{|x-2|-3} \rightarrow |x-2|-3 \geq 0 \rightarrow |x-2| \geq 3 \rightarrow x-2 \leq -3 \text{ , } x-2 \geq 3$$

$$x \leq -1 \text{ , } x \geq 5 \rightarrow \underline{D_f = (-\infty, -1] \cup [5, +\infty)}$$

$$y = \sqrt{4-12-x} \rightarrow 4-12-x \geq 0 \rightarrow 12-x \leq 4 \rightarrow -4 \leq 2-x \leq 4 \rightarrow -2 \leq x \leq 9$$

$$\underline{D_f = [-2, 9]}$$

$$\text{الف) } y = \sqrt{1-x|x|} \Rightarrow 1-x|x| \geq 0 \rightarrow |x| \geq x \rightarrow 1-x^2 \geq 0 \rightarrow 0 \leq x \leq 1$$

$$\rightarrow |x| = -x \rightarrow 1+x^2 \geq 0 \rightarrow D_f = (-\infty, 1]$$

$$\text{ب) } y = \frac{1}{\sqrt{3-|x-2|}-1} \rightarrow 3-|x-2| \geq 0 \rightarrow |x-2| \leq 3 \rightarrow -1 \leq x \leq 5$$

$$\sqrt{3-|x-2|}-1 \neq 0 \rightarrow \sqrt{3-|x-2|} \neq 1 \rightarrow 3-|x-2| \neq 1$$

$$|x-2| \neq 2 \rightarrow x \neq 4, x \neq 0 \rightarrow D_f = (0, 2) \cup (2, 4) \cup (4, 5]$$

$$\text{ج) } y = \frac{\sin^2 x - 1}{\cos x} \Rightarrow \cos x \neq 0 \rightarrow \cos x = 0 \Rightarrow x = \frac{\pi}{2} + k\pi$$

$$D_f = \mathbb{R} - \left\{ \frac{\pi}{2} + k\pi \mid k \in \mathbb{Z} \right\}$$

$$\text{د) } y = \frac{\cos x}{x \cos x - 1} \rightarrow x \cos x - 1 \neq 0 \rightarrow \cos x \neq \frac{1}{x} \rightarrow \cos x = \frac{1}{x}$$

$$x = 2k\pi \pm \frac{\pi}{2} \rightarrow D_f = \mathbb{R} - \left\{ 2k\pi \pm \frac{\pi}{2} \mid k \in \mathbb{Z} \right\}$$

$$\text{هـ) } y = \frac{x+3}{|x+1|-|x+3|} \rightarrow |x+1|-|x+3| \neq 0 \rightarrow |x+1| \neq |x+3|$$

$$x+1 = x+3 \Rightarrow x=2, \quad x+1 = -(x+3) \rightarrow x = -2 \Rightarrow x \neq 2, x \neq -2$$

$$D_f = \mathbb{R} - \left\{ 2, -2 \right\}$$

$$\text{و) } y = \sqrt{|x+1|-|x+3|} \rightarrow |x+1|-|x+3| \geq 0 \rightarrow |x+1| \geq |x+3|$$

$$\rightarrow (x+1)^2 \geq (x+3)^2 \rightarrow (x+1-x-3)(x+1+x+3) \geq 0 \rightarrow (x-2)(x+4) \geq 0$$

$$x=2, x=-4 \rightarrow x \leq -4 \text{ or } x \geq 2 \rightarrow D_f = (-\infty, -4] \cup [2, +\infty)$$

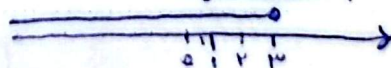
$$f(x) = \sqrt{\log_{\log_a}(\log_a(x-1))} \quad x-1 > 0 \rightarrow x > 1 \rightarrow x > \frac{1}{a}$$

$$\log_a(x-1) > 0 \rightarrow x-1 > 1 \rightarrow x > 2 \rightarrow x > 1$$

$$\log_{\log_a}(\log_a(x-1)) > 0 \rightarrow \log_a(x-1) \leq (\log_a a)^0 \rightarrow x-1 \leq a$$

$$x-1 \leq a \rightarrow x \leq a+1 \rightarrow x \leq 3$$

$$D_f = (1, 3]$$



$$\text{ز) } y = \log(x \cos x + 1) \rightarrow x \cos x + 1 > 0 \rightarrow \cos x > -\frac{1}{x}$$

$$D_f = x \in \left(-\frac{\pi}{2} + 2k\pi, \frac{\pi}{2} + 2k\pi \right), k \in \mathbb{Z}$$

$$\text{ح) } y = \sqrt{\log \frac{x-1}{x+1}} \quad \frac{x-1}{x+1} > 0 \rightarrow x < -1, x > 1$$

$$\log \frac{x-1}{x+1} > 0 \rightarrow \frac{x-1}{x+1} > 1 \rightarrow \frac{x-1}{x+1} - 1 > 0 \rightarrow \frac{-2}{x+1} > 0 \rightarrow x < -1$$

$$D_f = (-\infty, -1)$$