

$$f(x) = \sqrt{(x-2)x^2 + ax + b} \quad [2, +\infty)$$

$$f(x) = \sqrt{2x + b} \quad x=2 \quad a+b=0$$

$$\Rightarrow b = -4$$

$$\begin{array}{c} x^2 - 2x + 2 \\ \hline x^2 - 2x + 2 \\ \hline 0 \end{array} \quad \begin{array}{c} x^2 - 2x + 2 \\ \hline x^2 - 2x + 2 \\ \hline 0 \end{array}$$

تجزیه کنیم: $x^2 - 2x + 2 = (x-1)^2 + 1$
 این را می توانیم به صورت $(x-1)^2 + 1$ بنویسیم.
 در این صورت $x^2 - 2x + 2 = 0 \Rightarrow x = 1 \pm i$

$$f(x) = \sqrt{x^2 + 2x + 1 - m^2} \Rightarrow D_f = \mathbb{R} \quad \Delta \leq 0$$

$$x - x(x - m^2) = 0 \Rightarrow x m^2 - x = 0 \Rightarrow m = \pm 1$$

$$x - x(x - m^2) < 0 \Rightarrow \frac{-1 \pm 1}{+1 - 1 + 1} \Rightarrow m \in [-1, +1]$$

$$\Rightarrow m_{\max} = +1, m_{\min} = -1 \Rightarrow 1 - (-1) = 2$$

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

$$[x] + [-x] + 1 \neq 0 \Rightarrow [x] + [-x] = -1 \Rightarrow x \in \mathbb{Z}$$

$$\Rightarrow D_f = \{x \mid x \in \mathbb{Z}, x \in [-1, 1]\} \Rightarrow x \in \{-1, 0, 1\}$$

$$f(x) = \sqrt{x^2 + x} \Rightarrow y = |x| \sqrt{x+1} \Rightarrow x+1 \geq 0 \Rightarrow x \geq -1$$

$$\Rightarrow D_f = [-1, +\infty)$$

$$y = \sqrt{\frac{(x^2-1)(x^2-2x^2)}{x^2-1}} \quad x^2-1=0 \Rightarrow x=\pm 1$$

$$x^2-2x^2=0 \Rightarrow x=0, x=2$$

$$\Rightarrow D_f = (-\infty, -1] \cup [2, +\infty) \cup \{0\}$$

$$f(x) = \sqrt{|x+2| - x} \Rightarrow |x+2| - x = 0 \Rightarrow x = -1, x = +4$$

$$\Rightarrow D_f = \mathbb{R} - (1, 4)$$

$$y = \sqrt{x - |x-2|} \quad x - |x-2| = 0 \Rightarrow x = -2, x = +2$$

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

$$\text{a)} y = \sqrt{1-x|x|} \quad 1-x|x| = 0 \Rightarrow x=1$$

$$\Rightarrow \frac{+}{+} \frac{-}{-} \Rightarrow D_f = (-\infty, 1]$$

$$\text{b)} y = \frac{1}{\sqrt{x-|x-1|-1}} \Rightarrow \frac{1}{\sqrt{x-|x-1|}} \Rightarrow x-|x-1|=0$$

$$\Rightarrow \frac{+}{-} \frac{+}{+} \Rightarrow D_f = (x, y) \Rightarrow x=1, x=+1$$

$$\text{c)} y = \frac{\sin^2 x - 1}{\cos x} \quad \cos x \neq 0 \Rightarrow D_f = \mathbb{R} - \left\{ x \mid x \pm \frac{\pi}{2} \right\}$$

$$\text{d)} y = \frac{\cos x}{x \cos x - 1} \quad x \cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{x}$$

$$\Rightarrow D_f = \mathbb{R} - \left\{ x \mid x \pm \frac{\pi}{2}, x \pm \frac{\pi}{4} \right\}$$

$$\text{e)} y = \frac{x+c}{|x+1|-|x+c|} \Rightarrow |x+1|-|x+c| \neq 0 \Rightarrow |x+1| \neq |x+c|$$

$$\Rightarrow (x+1)^2 \neq (x+c)^2 \Rightarrow x^2 + 2x + 1 \neq x^2 + 2cx + c^2 \Rightarrow x^2 + 10x - 1 \neq 0$$

$$\Rightarrow x \neq \frac{y}{x} \quad x \neq \frac{2}{x}$$

$$\Rightarrow \sqrt{|x+1|-|x+c|} \quad |x+1|-|x+c| \geq 0 \Rightarrow |x+1| \geq |x+c| \Rightarrow (x+1)^2 \geq (x+c)^2$$

$$\Rightarrow x^2 + 10x - 1 \geq 0 \Rightarrow \frac{x}{+} \frac{c}{-} \Rightarrow D_f = \mathbb{R} - \left(\frac{x}{c}, c \right)$$

$$f(x) = \sqrt{\log \log_a^{(x-1)}} \quad \text{I} \quad x-1 > 0 \Rightarrow x > 1$$

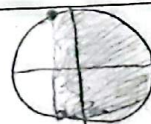
$$\text{II} : \log_a^{x-1} > 0 \Rightarrow x-1 > 1 \Rightarrow x > 2$$

$$\text{III} \log \log_a^{(x-1)} \geq 0 \Rightarrow \log_a^{(x-1)} \leq 1 \Rightarrow x-1 \leq a \Rightarrow x \leq c$$

$$\Rightarrow D_f = \text{I} \cap \text{II} \cap \text{III} = (1, c]$$

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

$$D_f = \mathbb{R} - \left[x \mid x \pm \frac{\pi}{2}, x \pm \frac{\pi}{4} \right]$$



$$\text{g)} y = \sqrt{\log \frac{x-1}{x+1}} \Rightarrow \frac{x-1}{x+1} > 0 \Rightarrow \frac{-1+1}{+1-1} \Rightarrow \log \frac{x-1}{x+1} \geq 0$$

$$\Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow \frac{x-1}{x+1} - 1 \geq 0 \Rightarrow \frac{-x}{x+1} \geq 0 \Rightarrow \frac{-1}{+1} \Rightarrow D_f = (-\infty, -1)$$