

۲. آفرین عالی نوشته! ~~مشق~~

$$f(x) = \sqrt{(a-1)x^2 + ax + b} \rightarrow \text{باید خط ۰} \rightarrow a-2=0 \rightarrow a=2$$

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

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

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

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

$$-1 \leq m \leq 1 \rightarrow 1 - (-1) = 2$$

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

همه اعداد صحیح بین -۲ و ۲ در دامنه هستند

$$-2, -1, 0, 1, 2 \Rightarrow \text{اعداد صحیح}$$

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

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

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

$$x \leq -1 \text{ و } x \geq 4 \rightarrow D_f = (-\infty, -1] \cup [4, +\infty)$$

$$y = \sqrt{4-|x-1|} \rightarrow 4-|x-1| \geq 0 \rightarrow |x-1| \leq 4 \rightarrow -4 \leq x-1 \leq 4 \rightarrow -3 \leq x \leq 5$$

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$$D_f = [-3, 5]$$

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

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

$$\text{ب) } y = \frac{1}{\sqrt{r-|x-\omega|}-1} \rightarrow r-|x-\omega| \geq 0 \rightarrow |x-\omega| \leq r \rightarrow r \leq x \leq \omega$$

$$\sqrt{r-|x-\omega|} - 1 \neq 0 \rightarrow \sqrt{r-|x-\omega|} \neq 1 \rightarrow r-|x-\omega| \neq 1$$

$$|x-\omega| \neq r \rightarrow x \neq r, x \neq \omega \rightarrow D_f = (r, \omega) \cup (\omega, r)$$

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

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

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

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

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

$$x+1 = x+r \Rightarrow x=r, x+1 = -(x+r) \rightarrow x = -\frac{r}{2}$$

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

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

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

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

$$f(x) = \sqrt{\log_{\log_a}(\log_a(x-1))}$$

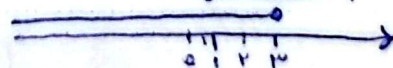
$$x-1 > 0 \rightarrow x > 1 \rightarrow x > \frac{1}{a}$$

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

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

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

$$D_f = (1, 1+a]$$



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

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

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

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

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

