

$$f(x) = \sqrt{(a-2)x^2 + ax + b}$$

$$D_f = [2, +\infty)$$

$$I: a-2 = 0 \Rightarrow a=2, \sqrt{2x+b}$$

$$II: x=2, 4+b=0 \Rightarrow \boxed{b=-4}$$

۲. برای اینکه عبارت تحت رادیکال ضرب x^2 را صفر می‌گذاریم.

می‌دانیم ریشه آن ۲ است پس x را برابر ۲ می‌گذاریم

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

$$1 - m^2 \geq 0 \Rightarrow m^2 \leq 1 \Rightarrow -1 \leq m \leq 1 \quad 1 - (-1) = \boxed{2}$$

$$f(x) = \frac{\sqrt{\varepsilon - x^2}}{[x] + [-x] + 1}$$

$$I: \varepsilon - x^2 \geq 0 \Rightarrow x^2 \leq \varepsilon \Rightarrow -2 \leq x \leq 2 \Rightarrow -2, -1, 0, 1, 2$$

$$[x] + [-x] \rightarrow \begin{matrix} \mathbb{Z} = 0 \\ \mathbb{Q} = -1 \end{matrix}$$

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$$y = \sqrt{x^3 + 3x^2} \Rightarrow x^3 + 3x^2 \geq 0 \Rightarrow x^2(x+3) \geq 0$$

$$D_f = \boxed{[-3, +\infty)}$$

$$y = \sqrt{\frac{(x^2-1)(x^2-3x^2)}{x^2-1}} \Rightarrow \frac{(x-1)(x+1)x^2(x-3)}{(x-1)(x^2+x+1)} \Rightarrow$$

$$\boxed{(-\infty, -1] \cup [3, +\infty)}$$

$$y = \sqrt{|x-2| - 3} \Rightarrow |x-2| - 3 \geq 0 \Rightarrow |x-2| \geq 3$$

$$x-2 \leq -3 \quad \text{or} \quad x-2 \geq 3$$

$$x \leq -1 \quad \text{or} \quad x \geq 5$$

$$D_f = (-\infty, -1] \cup [5, +\infty)$$

$$y = \sqrt{\epsilon - |x-2|} \Rightarrow \epsilon - |x-2| \geq 0 \Rightarrow |x-2| \leq \epsilon \Rightarrow -\epsilon \leq x-2 \leq \epsilon$$

$$\Rightarrow -2 \leq x \leq 4 \Rightarrow D_f = [-2, 4]$$

$$y = \sqrt{-x|x|} \Rightarrow -x|x| \geq 0$$

$\begin{matrix} \nearrow x \\ \rightarrow - \\ \searrow 0 \end{matrix}$

$$\Rightarrow D_f = (-\infty, 0]$$

$$y = \frac{1}{\sqrt{3 - |x-5|} - 1} \Rightarrow I: 3 - |x-5| \geq 0 \Rightarrow |x-5| \leq 3 \Rightarrow$$

$$-3 \leq x-5 \leq 3 \Rightarrow 2 \leq x \leq 8$$

$$II: \sqrt{3 - |x-5|} - 1 \neq 0 \Rightarrow \sqrt{3 - |x-5|} \neq 1 \Rightarrow 3 - |x-5| \neq 1$$

$$|x-5| \neq 2 \Rightarrow x \neq 3, 7$$

$$I \cup II \Rightarrow [2, 3) \cup (3, 7) \cup (7, 8]$$

$$y = \frac{\sin^2 x - 1}{\cos x} \Rightarrow \cos x \neq 0$$


$$D_f = \mathbb{R} - \left\{ \frac{k\pi}{2} \right\}$$

$$y = \frac{\cos x}{\gamma \cos x - 1} \Rightarrow \gamma \cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{\gamma}$$


$$D_f = \mathbb{R} - \left\{ \gamma k\pi \pm \frac{\pi}{\gamma} \right\}$$

$$y = \frac{x+r}{|rx+1|-|x+r|} \Rightarrow |rx+1| - |x+r| \neq 0 \Rightarrow |rx+1| \neq |x+r| \quad (\text{و لا})$$

$$\left. \begin{array}{l} rx+1 \neq x+r \Rightarrow x \neq r \\ rx+1 \neq -x-r \Rightarrow x \neq -\frac{\epsilon}{r} \end{array} \right\} D_f = R - \left\{ -\frac{\epsilon}{r}, r \right\}$$

$$y = \sqrt{|rx+1| - |x+r|} \Rightarrow |rx+1| - |x+r| \geq 0 \Rightarrow$$

$$|rx+1| \geq |x+r| \Rightarrow (rx+1)^2 \geq (x+r)^2 \Rightarrow \epsilon x^2 + \epsilon x + 1 \geq x^2 + 2rx + r^2$$

$$\epsilon x^2 - 2rx - 1 \geq 0 \quad \frac{r \pm \sqrt{100}}{\epsilon} = x_1 = r, \quad x_2 = -\frac{\epsilon}{r}$$

$$D_f = \left(-\infty, -\frac{\epsilon}{r} \right] \cup [r, +\infty)$$

$$f(x) = \sqrt{\log_{0.5}(\log_2(2x-1))} \Rightarrow \log_{0.5}(\log_2(2x-1)) \geq 0$$

$\searrow \frac{1}{r} < 1$

$$0 < \log_2(2x-1) \leq 1 \Rightarrow 1 < 2x-1 \leq 2 \Rightarrow 2 < 2x \leq 4 \Rightarrow \boxed{1 < x \leq 2}$$

$$\boxed{D_f = (1, 2]}$$

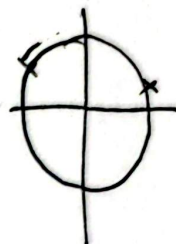
$$\text{I: } 2x-1 > 0 \Rightarrow 2x > 1 \Rightarrow x > \frac{1}{2} \checkmark$$

$$\text{II: } \log_2(2x-1) > 0 \Rightarrow 2x-1 > 1 \Rightarrow x > 1 \checkmark$$

$$y = \log(r \cos \theta + 1) \Rightarrow r \cos \theta + 1 > 0 \Rightarrow r \cos \theta > -1$$

(Case - 1)

$$\cos \theta > -\frac{1}{r}$$



$$\left[R - \left[r k \pi + \frac{r \pi}{r}, r k \pi - \frac{r \pi}{r} \right] \right]$$

$$\begin{aligned}
 y &= \sqrt{\log \frac{x-1}{x+1}} \Rightarrow \log \frac{x-1}{x+1} \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow \frac{x-1}{x+1} - 1 \geq 0 \quad (\hookrightarrow) \\
 \frac{x-1-(x+1)}{x+1} &\geq 0 \Rightarrow \frac{-2}{x+1} \geq 0 \Rightarrow \boxed{(-\infty, -1)}
 \end{aligned}$$