

① $D: [3, +\infty) \rightarrow$ تابع یک معادله درجه است نه درجه دوم درجه دوم درجه دوم یا یک مشتق مثبت منهای و یا هیچ وقت مشتق نداریم

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

$\text{if } x=3 \Rightarrow f(x)=0$

$0 = \sqrt{4+b} \Rightarrow b=-4$

② $Df = 12 \rightarrow$ عبارت زیر رادیکال همیشه ندارد و همیشه عدد مثبتی است (تامنی)

$\Delta \leq 0 \rightarrow 4 - 4(2 - m^2) \leq 0$

$4 - 4 + m^2 \leq 0$

$m^2 - 4 \leq 0$

$m^2 \leq 4$

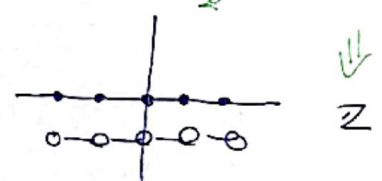
$-2 \leq m \leq 2$

انتقال / کمترین و بیشترین مقدار $m = 4 - (-4) = 8$

③ $f(x) = \frac{\sqrt{4-x^2}}{[x]+[x]+1} \rightarrow 4-x^2 \geq 0 \rightarrow [-2, 2]$

$[x]+[x]+1 \rightarrow [x]+[-x]+1 \neq 0 \Rightarrow [x]+[-x] \neq -1$

$-2, -1, 0, 1, 2 \Rightarrow$ ۵ عدد صحیح



④ $y = \sqrt{x^3 + 3x^2} \Rightarrow x^3 + 3x^2 \geq 0 \Rightarrow x^2(x+3) \geq 0$

$\Rightarrow D_f = [-3, +\infty)$

⑤ $y = \sqrt{\frac{(x^2-1)(x^3-3x^2)}{x^3-1}} \Rightarrow \frac{(x^2-1)(x^2(x-3))}{x^3-1} \geq 0$

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

الف) $y = \sqrt{|x-2| - 3} \Rightarrow |x-2| - 3 \geq 0 \Rightarrow |x-2| \geq 3$
 $\Rightarrow D_f = (-\infty, -1] \cup [5, +\infty)$

$\begin{cases} x \geq 2 \\ x < 2 \end{cases} \Rightarrow \begin{cases} x - 2 - 3 \geq 0 \Rightarrow x \geq 5 \\ 2 - x - 3 \geq 0 \Rightarrow x \leq -1 \end{cases}$

ب) $y = \sqrt{\varepsilon - |x-4|} \Rightarrow \varepsilon - |x-4| \geq 0 \Rightarrow |x-4| \leq \varepsilon$

لـ 1) $\varepsilon + x^2 - \varepsilon x \leq 14 \Rightarrow x^2 - \varepsilon x - 12 \leq 0 \Rightarrow \frac{-2}{+} \quad \frac{4}{-} \quad +$

$\Rightarrow D_f = (-\infty, -2] \cup [4, +\infty)$

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

$\begin{matrix} 1 & 1 & \checkmark \\ -1 & +1 & \checkmark \end{matrix} \rightarrow \text{نقطة (مقبول)}$

$D_f = (-\infty, 1]$

ب) $y = \frac{1}{\sqrt{3 - |x-2| - 1}} \Rightarrow 3 - |x-2| - 1 > 0 \Rightarrow |x-2| < 2 \Rightarrow x^2 + 2x - 10 < \varepsilon$

$\Rightarrow x^2 - 10x + 21 < 0 \Rightarrow \frac{3}{+} \quad \frac{7}{-} \quad + \Rightarrow D_f = (3, 7)$

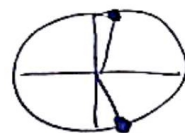
الف) $y = \frac{\sin^2 x - 1}{\cos x} \Rightarrow \cos x \neq 0$



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

ب) $y = \frac{\cos x}{2\cos x - 1} \Rightarrow 2\cos x - 1 \neq 0 \Rightarrow \cos x \neq \frac{1}{2}$

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



$$\omega) y = \frac{x+3}{|2x+1| - |x+3|} \Rightarrow |2x+1| - |x+3| \neq 0 \quad (1)$$

$$\Rightarrow |2x+1| \neq |x+3|$$

$$\xrightarrow{1)} \quad \cancel{x^2} + 1 + \cancel{x} \neq \cancel{x^2} + 9 + \cancel{x} \Rightarrow x^2 - 2x - 1 \neq 0$$

$$\Rightarrow x^2 - 2x - 2\varepsilon \neq 0 \Rightarrow (x-4)(x+\varepsilon) \neq 0 \Rightarrow x \neq \frac{4}{3} \quad \frac{-\varepsilon}{3}$$

$$\Rightarrow D_f = \mathbb{R} - \left\{ \frac{4}{3}, -\frac{\varepsilon}{3} \right\}$$

$$\psi) \sqrt{|2x+1| - |x+3|} \Rightarrow |2x+1| - |x+3| \geq 0 \Rightarrow$$

$$|2x+1| \geq |x+3| \xrightarrow{1)} \quad \cancel{x^2} + 1 + \cancel{x} \geq \cancel{x^2} + 9 + \cancel{x} \Rightarrow$$

$$x^2 - 2x - 1 \geq 0 \quad \frac{-\frac{2}{-1} \pm \sqrt{\frac{4}{1} + 4}}{2} \Rightarrow D_f = (-\infty, -\frac{1}{3}] \cup [2, +\infty)$$

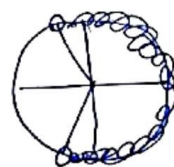
$$f(x) = \sqrt{\log_{\log \frac{1}{8}} (2x-1)} \Rightarrow \log_{\log \frac{1}{8}} (2x-1) \geq 0 \rightarrow 2x-1 > 0 \Rightarrow x > \frac{1}{2} \quad (2)$$

$$\log_{\frac{1}{8}} (2x-1) \geq 0 \Rightarrow 2x-1 \geq \frac{1}{8} \Rightarrow x \geq \frac{5}{8}$$

$$\Rightarrow D_f = \left[\frac{5}{8}, +\infty \right)$$

$$\text{ان} y = \log (2\cos x + 1) \Rightarrow 2\cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{2} \quad (10)$$

$$\Rightarrow D_f = \left(2k\pi - \frac{2\pi}{3}, 2k\pi + \frac{2\pi}{3} \right)$$



$$\beta) y = \sqrt{\log \frac{x-1}{x+1}} \Rightarrow \log \frac{x-1}{x+1} \geq 0 \Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow \frac{-1}{x+1} \geq 0 \quad (-\infty, -1) \cup [1, +\infty)$$

$$\Rightarrow \frac{x-1}{x+1} \geq 1 \Rightarrow \frac{x-1}{x+1} - 1 \geq 0 \Rightarrow \frac{-2}{x+1} \geq 0 \Rightarrow D_f = (-\infty, -1)$$