

الف) $y = \frac{x+3}{2x^3+3x^2-11x+3} = \frac{x+3}{(x-1)(2x^2+5x-3)} = \frac{(x+3)}{(x-1)(2x-1)(x+3)}$ $Df = \mathbb{R} - \left\{1, \frac{1}{2}, -3\right\}$ ✓ (۲)

ب) $y = \frac{x+3}{2x^3+9x^2+10x+3} = \frac{x+3}{(x+1)(2x+1)(x+3)} \Rightarrow Df = \mathbb{R} - \left\{-1, -\frac{1}{2}, -3\right\}$ ✓

الف) $y = \frac{x+3}{x^3-2x^2+2x-1} = \frac{(x+3)}{(x-1)(x^2-x+1)} \Rightarrow Df = \mathbb{R} - \{1\}$ ✓ (۲)

ب) $y = \sqrt{\frac{x+3}{x^3-2x^2+2x-1}} = \sqrt{\frac{x+3}{(x-1)(x^2-x+1)}} \Rightarrow \frac{-3}{+4-6} \Rightarrow Df = (-\infty, -3] \cup (1, +\infty)$ ✓
همواره مثبت و ریشه ندارد

$y = \frac{2}{x^2-5|x-1|-2x+5}$ ✓
(I) $\cup$ (II)
 $\Rightarrow Df = \mathbb{R} - \{-2, 0, 2, 5\}$ ✓
 $\frac{2}{x^2+3x} = \frac{2}{x(x+3)} \Rightarrow x \neq 0, x \neq -3$
 $\frac{2}{x^2-7x+10} = \frac{2}{(x-2)(x-5)} \Rightarrow x \neq 2, x \neq 5$
 $\Rightarrow x \neq \{0, -3\}$ (I) $\Rightarrow x \neq \{2, 5\}$ (II)

الف) $y = \frac{x+3}{|2x+1|-|x+3|}$ ✓
(I) $\cup$ (II) $\cup$ (III)
 $\Rightarrow Df = \mathbb{R} - \left\{-\frac{2}{3}, 2\right\}$ ✓
 $\frac{-3}{-2x-1+x+3} = \frac{-3}{-x+2} \Rightarrow x \neq 2$
 $\frac{-3}{-2x-1-x-3} = \frac{-3}{-3x-4} \Rightarrow x \neq -\frac{4}{3}$
 $\frac{2x+1-x-3}{2x+1-x-3} = \frac{x-2}{x-2} \Rightarrow x \neq 2$
 $\frac{2x+1-x-3}{2x+1-x-3} = \frac{x-2}{x-2} \Rightarrow x \neq -\frac{1}{2}$
 $\frac{2x+1-x-3}{2x+1-x-3} = \frac{x-2}{x-2} \Rightarrow x \neq \frac{2}{3}$

الف) $y = \log_{\frac{1}{3}}(1-\log_{\frac{1}{3}}x)$ ✓
(I) $\cap$ (II)
 $\Rightarrow 0 < x < 3 \Rightarrow Df = (0, 3)$ ✓
 $1 - \log_{\frac{1}{3}}x > 0 \Rightarrow \log_{\frac{1}{3}}x < 1 \Rightarrow x < 3$ (II)

ب) $y = \log_{\frac{1}{3}}(1-\log_{\frac{1}{3}}\frac{x}{\frac{1}{3}})$ ✓
(I) $\cap$ (II)
 $\Rightarrow Df = (\frac{1}{3}, +\infty)$ ✓
 $1 - \log_{\frac{1}{3}}\frac{x}{\frac{1}{3}} > 0 \Rightarrow \log_{\frac{1}{3}}\frac{x}{\frac{1}{3}} < 1 \Rightarrow \frac{1}{3} < x$ (II)

۵ سوال ب) $y = \sqrt{|2x+1|-|x+3|}$ ✓
 $\Rightarrow |2x+1|-|x+3| \geq 0 \Rightarrow |2x+1| \geq |x+3|$
 $\Rightarrow (2x+1)^2 \geq (x+3)^2 \Rightarrow 4x^2+4x+1 \geq x^2+6x+9 \Rightarrow 3x^2-2x-8 \geq 0$
 $\Rightarrow (x-2)(3x+4) \geq 0 \Rightarrow \frac{-4}{3} \leq x \leq 2$
 $Df = [-\infty, -\frac{4}{3}] \cup [2, +\infty)$ ✓

$$f(x) = \sqrt{\log_{\log_{\omega}}(2x-1)}$$

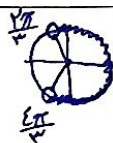
$$2x-1 > 0 \Rightarrow x > \frac{1}{2} \quad (I)$$

$$\Rightarrow \log_{\omega}(2x-1) > 0 \Rightarrow 2x-1 < \omega \Rightarrow x < 3 \quad (II)$$

$$2x-1 > 1 \Rightarrow x > 1 \quad (III)$$

$$(I) \cap (II) \cap (III) \Rightarrow D_f = (1, 3] \quad \checkmark$$

الف) $y = \log(2\cos x + 1) \rightarrow 2\cos x + 1 > 0 \Rightarrow \cos x > -\frac{1}{2}$



$$D_f = (2k\pi - \frac{\pi}{3}, 2k\pi + \frac{\pi}{3}) \quad \checkmark$$

ب) $y = \sqrt{\log \frac{x-1}{x+1}} \rightarrow \frac{x-1}{x+1} > 0 \rightarrow \frac{-1}{+} \frac{+}{-} \rightarrow (-\infty, -1) \cup (1, +\infty) \quad (I)$

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

$$\log \frac{x-1}{x+1} > 0 \Rightarrow \frac{x-1}{x+1} > 1 \Rightarrow \frac{x-1}{x+1} - 1 > 0 \Rightarrow \frac{-2}{x+1} > 0 \Rightarrow \frac{-1}{+} \frac{+}{-} \rightarrow (-\infty, -1) \quad (II)$$

$f(x) = \sqrt{(a+y)x^2 + ax + b}$ ضریب x^2 باید به باشد زیرا دامنه متعلق به تابع خطی است:

$$a+y=0 \Rightarrow a=-y \Rightarrow f(x) = \sqrt{-yx+b}$$

$$\left. \begin{aligned} -yx+b &\geq 0 \Rightarrow x \leq \frac{b}{y} \\ D_f &= (-\infty, \frac{b}{y}] \end{aligned} \right\} \Rightarrow \frac{b}{y} = 3 \Rightarrow b = 6 \quad \checkmark$$

$f(x) = \sqrt{x^2 + 2x + 2 - m^2}$ دامنه تابع برابر اعداد حقیقی می باشد در شیب عبارت زیر را در یکال محصوره نامی است.

$$x^2 + 2x + 2 - m^2 \geq 0$$

شرط نامشکی: $a > 0 \rightarrow 1 > 0 \quad \checkmark$

$$\rightarrow \Delta = 4 - 4(2 - m^2) \leq 0 \Rightarrow 4m^2 - 4 \leq 0 \Rightarrow m^2 - 1 \leq 0 \Rightarrow (m-1)(m+1) \leq 0$$

$$\rightarrow \frac{-1}{+} \frac{+}{-} \rightarrow -1 \leq m \leq 1 \rightarrow \text{بسیارترین} \quad 1 - (-1) = 2 \quad \checkmark$$

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

$$[x] + [-x] + 1 \rightarrow x \in \mathbb{Z} \quad (II)$$

$$y = [x] + [-x] \rightarrow y = [x] + [-x] + 1$$

$$\Rightarrow D_f = \{-2, -1, 0, 1, 2\} \quad \checkmark$$

