

الف) $y = \frac{x+3}{2x^3+3x^2-11x+3} \Rightarrow 2x^3+3x^2-11x+3 \neq 0$

$\Rightarrow (x-1)(x+3)(x-\frac{1}{2}) \neq 0 \Rightarrow D_f = \mathbb{R} - \{-3, \frac{1}{2}, 1\}$

سوال 1

$$\begin{array}{r} 2x^3+3x^2-11x+3 \mid x-1 \\ \underline{2x^3-2x^2} \\ 5x^2-11x+3 \\ \underline{5x^2-5x} \\ -6x+3 \\ \underline{-6x+3} \\ 0 \end{array}$$

$$\begin{array}{r} 2x^3+3x^2-11x+3 \mid x+\frac{1}{2} \\ \underline{2x^3+2x^2} \\ x^2+10x+3 \\ \underline{x^2+x} \\ 9x+3 \\ \underline{9x+3} \\ 0 \end{array}$$

$$\begin{array}{r} 2x^3+3x^2-11x+3 \mid x-1 \\ \underline{2x^3-2x^2} \\ 5x^2-11x+3 \\ \underline{5x^2-5x} \\ -6x+3 \\ \underline{-6x+3} \\ 0 \end{array}$$

$$\begin{array}{r} 2x^3+3x^2-11x+3 \mid x+\frac{1}{2} \\ \underline{2x^3+2x^2} \\ x^2+10x+3 \\ \underline{x^2+x} \\ 9x+3 \\ \underline{9x+3} \\ 0 \end{array}$$

ب) $y = \frac{x+3}{2x^3+9x^2+10x+3} \Rightarrow 2x^3+9x^2+10x+3 \neq 0$

$\Rightarrow (x+1)(2x^2+7x+3) \neq 0 \Rightarrow D_f = \mathbb{R} - \{-1\}$

سوال 2

$$\begin{array}{r} 2x^3+9x^2+10x+3 \mid x+1 \\ \underline{2x^3+2x^2} \\ 7x^2+10x+3 \\ \underline{7x^2+7x} \\ 3x+3 \\ \underline{3x+3} \\ 0 \end{array}$$

$$\begin{array}{r} 2x^3+9x^2+10x+3 \mid x+1 \\ \underline{2x^3+2x^2} \\ 7x^2+10x+3 \\ \underline{7x^2+7x} \\ 3x+3 \\ \underline{3x+3} \\ 0 \end{array}$$

$$\begin{array}{r} 2x^3+9x^2+10x+3 \mid x+1 \\ \underline{2x^3+2x^2} \\ 7x^2+10x+3 \\ \underline{7x^2+7x} \\ 3x+3 \\ \underline{3x+3} \\ 0 \end{array}$$

الف) $y = \frac{x+3}{x^3-2x^2+2x-1} \Rightarrow x^3-2x^2+2x-1 \neq 0$

$\Rightarrow (x-1)(x^2-x+1) \neq 0 \Rightarrow D_f = \mathbb{R} - \{1\}$

سوال 3

$$\begin{array}{r} x^3-2x^2+2x-1 \mid x-1 \\ \underline{x^3-x^2} \\ -x^2+2x-1 \\ \underline{-x^2+x} \\ -x-1 \\ \underline{-x-1} \\ 0 \end{array}$$

$$\begin{array}{r} x^3-2x^2+2x-1 \mid x-1 \\ \underline{x^3-x^2} \\ -x^2+2x-1 \\ \underline{-x^2+x} \\ -x-1 \\ \underline{-x-1} \\ 0 \end{array}$$

$$\begin{array}{r} x^3-2x^2+2x-1 \mid x-1 \\ \underline{x^3-x^2} \\ -x^2+2x-1 \\ \underline{-x^2+x} \\ -x-1 \\ \underline{-x-1} \\ 0 \end{array}$$

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

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

سوال 4

$$\begin{array}{r} x^3-2x^2+2x-1 \mid x-1 \\ \underline{x^3-x^2} \\ -x^2+2x-1 \\ \underline{-x^2+x} \\ -x-1 \\ \underline{-x-1} \\ 0 \end{array}$$

$$\begin{array}{r} x^3-2x^2+2x-1 \mid x-1 \\ \underline{x^3-x^2} \\ -x^2+2x-1 \\ \underline{-x^2+x} \\ -x-1 \\ \underline{-x-1} \\ 0 \end{array}$$

$$\begin{array}{r} x^3-2x^2+2x-1 \mid x-1 \\ \underline{x^3-x^2} \\ -x^2+2x-1 \\ \underline{-x^2+x} \\ -x-1 \\ \underline{-x-1} \\ 0 \end{array}$$

سوال ۳

$$y = \frac{r}{x^2 - \omega |x-1| - 2x + \omega} \Rightarrow x^2 - \omega |x-1| - 2x + \omega \neq 0$$

$$x \geq 1 \Rightarrow x^2 - \omega x + \omega - 2x + \omega \neq 0 \Rightarrow x^2 - (2+\omega)x + 2\omega \neq 0 \Rightarrow (x-\omega)(x-2) \neq 0$$

$$\Rightarrow x \neq 2, \omega$$

$$x < 1 \Rightarrow x^2 - \omega + \omega x - 2x + \omega \neq 0 \Rightarrow x^2 + 3x \neq 0 \Rightarrow x(x+3) \neq 0$$

$$\Rightarrow x \neq 0, -3 \quad D_f = \mathbb{R} - \{0, 2, \omega, -3\} \quad \circ$$

$$D_f = \left\{ \mathbb{R} - \{k\} \mid \text{if } x \geq 1 \Rightarrow k = 2, \omega \text{ or if } x < 1 \Rightarrow k = 0, -3 \right\}$$

سوال ۴

۱) $y = \sqrt{[-x] - 2} \Rightarrow [-x] - 2 \geq 0 \Rightarrow [-x] \geq 2$ متنی را بنویسید برایت خارج کن! مثلاً $x = -1.5$ در نام دارد، یعنی کند!

$[-x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2$

$\Rightarrow [x] \leq -2 \Rightarrow x < -1 \Rightarrow D_f = (-\infty, -1)$

$D_f = (-\infty, -2]$

۲) $y = \frac{\omega x^2 + 4}{[x]^2 - 2[x] - 3} \Rightarrow [x]^2 - 2[x] - 3 \neq 0$

$[x] = t \rightarrow t^2 - 2t - 3 \neq 0$

$$\Rightarrow (t-3)(t+1) \neq 0 \Rightarrow t \neq -1, 3$$

$$\Rightarrow [x] \neq -1, 3 \Rightarrow x \neq [-1, 0) \cup [3, 4)$$

$$\Rightarrow D_f = \mathbb{R} - [-1, 0) \cup [3, 4)$$

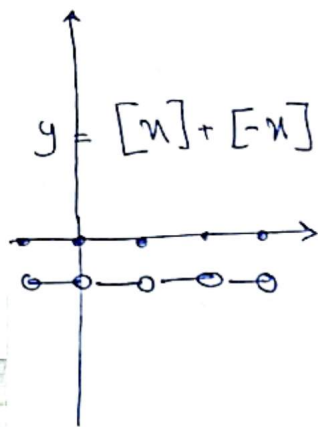
سوال ۵

الف) $y = \sqrt{\left[x - \frac{1}{3}\right] + \left[x + \frac{2}{3}\right]} \Rightarrow \left[x - \frac{1}{3}\right] + \left[x + \frac{2}{3}\right] \geq 0$

$$\Rightarrow \left[x - \frac{1}{3}\right] + \left[x - \frac{1}{3} + 1\right] \geq 0 \Rightarrow 2\left[x - \frac{1}{3}\right] + 1 \geq 0 \Rightarrow \left[x - \frac{1}{3}\right] \geq -\frac{1}{2}$$

$$\Rightarrow \left[x - \frac{1}{3}\right] \geq 0 \Rightarrow x \geq \frac{1}{3} \Rightarrow D_f = \left[\frac{1}{3}, +\infty\right)$$

$$\text{ب) } y = \sqrt{\left[x - \frac{1}{x}\right] + \left[\frac{1}{x} - x\right]} \Rightarrow \left[x - \frac{1}{x}\right] + \left[\frac{1}{x} - x\right] \geq 0$$



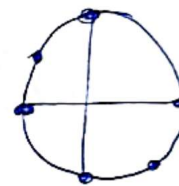
$$\left. \begin{array}{l} y = [x] + [1/x] \\ x \in \mathbb{Z} \quad y = 0 \\ x \in \mathbb{Z} \quad y = -1 \end{array} \right\} \Rightarrow x - \frac{1}{x} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{x}$$

$$\Rightarrow D_f = \left\{ x \mid x = k + \frac{1}{x}, k \in \mathbb{Z} \right\}$$

$$y = \frac{\cot x + 1}{\tan x + 1} = \frac{\frac{\cos x}{\sin x} + 1}{\frac{\sin x}{\cos x} + 1}$$

$$\text{الف) } \tan x + 1$$

$$\Rightarrow \sin x \neq 0 \\ \cos x \neq 0 \\ \tan x \neq -1$$



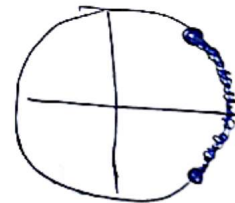
سوال 4

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

$$\sqrt{\frac{1}{x}} = \frac{1}{x}$$

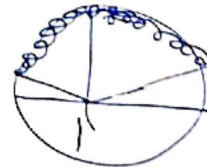
$$\text{ب) } y = \sqrt{1 - 4 \sin^2 x} \Rightarrow 1 - 4 \sin^2 x \geq 0 \Rightarrow 4 \sin^2 x \leq 1 \Rightarrow \sin^2 x \leq \frac{1}{4}$$

$$\Rightarrow \frac{1}{2} \leq \sin x \leq \frac{1}{2}$$



$$D_f = \left[k\pi - \frac{\pi}{x}, k\pi + \frac{\pi}{x} \right]$$

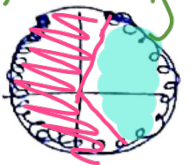
$$\text{الف) } y = \sqrt{2 \sin x - 1} \Rightarrow 2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2}$$



سوال 7

$$\Rightarrow D_f = \left[2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4} \right]$$

$$\text{ب) } y = \sqrt{1 - 2 \cos x} \Rightarrow 1 - 2 \cos x \geq 0 \Rightarrow 2 \cos x \leq 1 \Rightarrow \cos x \leq \frac{1}{2}$$



یا بازه قابل قبول

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

راه در شرفی صفی آخر

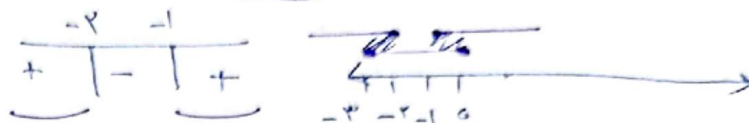
1/4

سوال 1

$$y = \arcsin(x^2 + 3x + 1) \Rightarrow -1 \leq x^2 + 3x + 1 \leq 1$$

$$\Rightarrow -2 \leq x^2 + 3x \leq 0 \Rightarrow x^2 + 3x \leq 0$$

$$\Leftrightarrow x^2 + 3x \geq 0 \Rightarrow (x+1)(x+2) \geq 0$$



$$\Rightarrow D_f = [-2, -1] \cup [-1, 0]$$

1,8

$$b) \cos y = \sqrt{5-2x} \Rightarrow -1 \leq \sqrt{5-2x} \leq 0$$

$$5-2x \geq 0$$

$$2x \leq 5$$

$$x \leq \frac{5}{2}$$

جواب cos بین -1 و 1 است

$$\sqrt{5-2x} \leq 0 \Rightarrow 5-2x = 0 \Rightarrow x = \frac{5}{2}$$

$$\sqrt{5-2x} \geq -1 \Rightarrow 5-2x \leq 1 \Rightarrow x \geq 2$$

$$\sqrt{5-2x} \geq -1 \xrightarrow{\text{جواب: } \sqrt{\text{مقدار}} \geq 0} \sqrt{5-2x} \geq 0$$

$$\Rightarrow D_f = \left[\frac{5}{2}, \frac{5}{2} \right]$$

$$5-2x \geq 0 \Rightarrow 2x \leq 5$$

$$x \leq \frac{5}{2}$$

$$D_f = \left[2, \frac{5}{2} \right]$$

$$الف) y = \log_2(1 - \log_3 x)$$

$$x > 0$$

$$1 - \log_3 x > 0 \Rightarrow \log_3 x < 1$$

$$\Rightarrow x < 3$$

$$\Rightarrow D_f = (0, 3)$$

سوال 9

1,8

$$ب) y = \log_2\left(1 - \log_{\frac{1}{3}} x\right)$$

$$x > 0$$

$$1 - \log_{\frac{1}{3}} x > 0 \Rightarrow \log_{\frac{1}{3}} x < 1$$

چون مبنا بین 0 و 1 است

حسب نامعادله عوض می شود!

$$\Rightarrow x < \left(\frac{1}{3}\right)^1 = \frac{1}{3}$$

$$\log_{\frac{1}{3}} x < 1 \Rightarrow x > \frac{1}{3} \Rightarrow D_f = \left(\frac{1}{3}, +\infty\right)$$

$$D_f = (0, 1)$$

$$الف) y = \sqrt{r^2 \varepsilon n - n^2} - 1 \Rightarrow r^2 \varepsilon n - n^2 - 1 \geq 0$$

$$\Rightarrow r^2 \varepsilon n - n^2 \geq 1 \Rightarrow r^2 \varepsilon n - n^2 \geq r^2 \Rightarrow r^2 \varepsilon n - n^2 \geq r^2 \Rightarrow$$

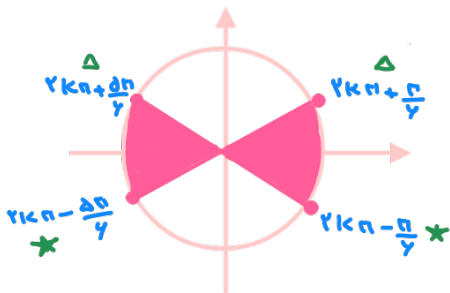
$$n^2 - \varepsilon n + r^2 \leq 0 \Rightarrow \frac{1}{+} \frac{1}{-} \frac{r^2}{+} \Rightarrow \boxed{D_f = [1, r^2]}$$

$$ب) y = \left(\frac{rn + \omega}{rn + \varepsilon} \right)! \Rightarrow \frac{rn + \omega}{rn + \varepsilon} \in W \Rightarrow -\frac{r\omega - \omega}{r\omega - r} \in W$$

$$\Rightarrow \boxed{D_f = \left\{ n \mid n = \frac{\omega - rK}{rK - r}, K \in W \right\}}$$

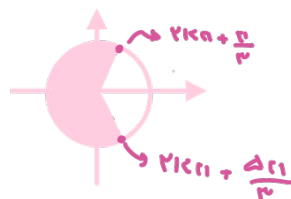
$$الف - 4) [-n] - r \geq 0 \rightarrow [-n] \geq r \rightarrow -n \geq r \rightarrow n \leq -r \rightarrow D_f = (-\infty, -r]$$

$$ب - 4) 1 - r \sin^2 n \geq 0 \rightarrow r \sin^2 n \leq 1 \rightarrow \sin^2 n \leq \frac{1}{r} \rightarrow -\frac{1}{r} \leq \sin n \leq \frac{1}{r}$$



$$\rightarrow D_f = \left[rkn - \frac{\Delta n}{y}, rkn + \frac{\Delta n}{y} \right]$$

$$ب - 5) 1 - r \cos n \geq 0 \rightarrow \cos n \leq \frac{1}{r}$$



$$\rightarrow D_f = \left[rkn + \frac{\Delta n}{y}, rkn + \frac{\Delta n}{y} \right]$$

$$9 - \text{ب}) \quad y = \log_2 \left(1 - \log^{\frac{n}{2}} \right) \rightarrow \log^{\frac{n}{2}} \rightarrow n > .$$

$$\hookrightarrow 1 - \log^{\frac{n}{2}} > 0 \rightarrow \log^{\frac{n}{2}} < 1 \xrightarrow{\text{مناسب (نه 1)}} n > \frac{1}{2}$$

$$Df_2 \left(\frac{1}{2}, +\infty \right)$$

$$8 - \text{ب}) \quad \sqrt{5-2n} \rightarrow 5-2n \geq 0 \rightarrow n \leq \frac{5}{2}$$

$$\xrightarrow{n} Df_2 \left[2, \frac{5}{2} \right]$$

$$\underbrace{-1}_{\text{همواره برقرار است}} \leq \sqrt{5-2n} \leq 1 \rightarrow 5-2n \leq 1 \rightarrow -2n \leq -4 \rightarrow n \geq 2$$

همواره برقرار است ✓