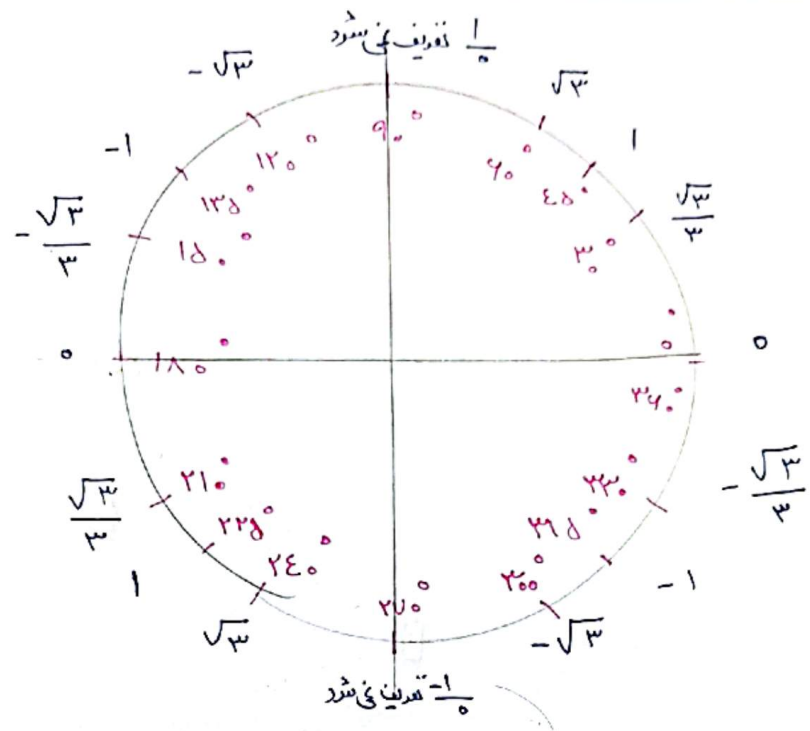


سوال ۱



سوال ۲

الف) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{3\pi}{4} = \frac{1}{2} + (-1) + 2(-1) = -\frac{3}{2}$

ب) $-\cos \frac{5\pi}{4} + \sin \frac{2\pi}{3} - 3 \sin \frac{4\pi}{3} = \frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - 3(-\frac{\sqrt{3}}{2}) = \frac{5\sqrt{3}}{2}$

ج) $\cot \frac{2\pi}{3} + 2 \cot \frac{4\pi}{3} - 2 \tan \frac{5\pi}{4} = -\frac{\sqrt{3}}{3} + 2 \times \frac{\sqrt{3}}{3} - 2(-\frac{\sqrt{3}}{3}) = \frac{4\sqrt{3}}{3}$

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{3}) = \cos(0) + \sin(\frac{\pi}{3}) = 1 + \frac{\sqrt{3}}{2}$

سوال ۳

$$f(x) = \begin{cases} x^2 + \varepsilon x & x \geq a \\ 2x + a + 2 & x \leq a \end{cases} \rightarrow \begin{cases} x=a & a^2 + \varepsilon a = 2a + 2 \\ a^2 + a - 2 = 0 & (a-1)(a+2) \end{cases}$$

$\Rightarrow f(1) = 1 + \varepsilon = 5$

سوال ۴

$$f(x) = \begin{cases} 2x^2 - b & |x+1| \geq 2 \\ a + 2x & -3 \leq x \leq -1 \end{cases} \rightarrow \begin{cases} x+1 \geq 2 \\ x \geq 1 \end{cases} \cup \begin{cases} -x-1 \geq 2 \\ x \leq -3 \end{cases}$$

$$\xrightarrow{x=3} 18 - b = a - 4 \Rightarrow a + b = 22$$

عدد کلید
x = -3
طریقی بنویسند

$$الف) y = \frac{1}{x^3 - \varepsilon x^2}$$

$$x^3 - \varepsilon x^2 \neq 0$$

$$x^2(x - \varepsilon) \neq 0$$

$$x \neq 0, \varepsilon$$

$$D_f = \mathbb{R} - \{0, \varepsilon\}$$

$$ب) y = \frac{1}{2x^3 + \varepsilon x^2 + 2x + \varepsilon}$$

$$2x^3 + \varepsilon x^2 + 2x + \varepsilon \neq 0$$

$$\Rightarrow 2(x^3 + \varepsilon x^2 + x + \varepsilon) \neq 0$$

$$\Rightarrow 2(x^2(x + \varepsilon) + (x + \varepsilon)) \neq 0 \Rightarrow \frac{2}{\cancel{2}}(x + \varepsilon)(\underbrace{x^2 + 1}_{\text{مشتت}}) \neq 0 \Rightarrow x \neq -\varepsilon$$

$$D_f = \mathbb{R} - \{-\varepsilon\}$$

$$الف) y = \sqrt{x^2 - 1} + \sqrt{x - 2}$$

$$x^2 - 1 \geq 0$$

$$x - 2 \geq 0$$

$$x^2 \geq 1$$

$$x \geq 2$$

$$x \geq 1$$

$$x \leq -1$$



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

$$ب) y = \frac{\sqrt{4 - 3x}}{\sqrt{4x - 3}}$$

$$4 - 3x \geq 0$$

$$4x - 3 > 0$$

$$3x \leq 4$$

$$4x > 3$$

$$x \leq \frac{4}{3}$$

$$x > \frac{3}{4}$$



$$D_f = (\frac{3}{4}, \frac{4}{3}]$$

$$y = \sqrt{4x - a} + \sqrt{b - 3x}$$

$$D_f = \{2\}$$

$$12 - a = 0 \Rightarrow a = 12$$

$$b - 9 = 0 \Rightarrow b = 9$$

$$\frac{b}{a} = \frac{9}{12} = \boxed{\frac{3}{4}}$$

سوال ۷ یعنی هر دو عبارت به ازای یک مقدار

مافقی می شوند. اگر به ازای ۲ مثبت

چون ۱۱ ضاعلات آفرین دارند

هر دو عبارت به ازای ۲

صفر بردار اند

$$الف) y = \sqrt{\frac{x^2 - x - 4}{x^4 - 13x^2 + 36}}$$

$$\xrightarrow{\text{تجزیه}} (x-4)(x+1) \Rightarrow x \in (-\infty, -1) \cup (4, +\infty)$$

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$$\xrightarrow{\text{تجزیه}} (x-4)(x+1) \Rightarrow x \in (-\infty, -1) \cup (4, +\infty)$$

$$\Rightarrow D_f = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$$

سوال ۱

$$b) y = \sqrt{\frac{n^3 - 2n^2 - 8n + 4}{n^3 + 2n^2 - 8n - 4}} \Rightarrow \frac{n^3 - 2n^2 - 8n + 4}{n^3 + 2n^2 - 8n - 4} \geq 0$$

$$\begin{array}{r} n^3 + 2n^2 - 8n - 4 \overline{) n^3 + n^2} \\ \underline{-n^2 - 8n - 4} \\ n^2 - 8n \\ \underline{-n^2 + n} \\ -9n - 4 \\ \underline{-9n - 9} \\ 5 \end{array}$$

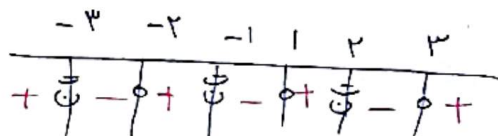
(n+3)(n-2)

$$\begin{array}{r} n^3 - 2n^2 - 8n + 4 \overline{) n^3 - n^2} \\ \underline{-n^2 - 8n + 4} \\ -n^2 - 8n \\ \underline{-n^2 + n} \\ -9n + 4 \\ \underline{-9n + 9} \\ -5 \end{array}$$

(n-3)(n+2)

$$\Rightarrow \frac{(n-1)(n-3)(n+2)}{(n+1)(n+3)(n-2)} \geq 0$$

$$\Rightarrow D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$$



$$الف) y = \sqrt{2[n] - 8}$$

$$\Rightarrow 2[n] - 8 \geq 0 \Rightarrow [n] \geq 4$$

سؤال 9 =

$$\Rightarrow n \geq 4$$

$$\Rightarrow D_f = [4, +\infty)$$

مبرك الله لك ولجميع قسنته

$$ب) y = \sqrt{2[n] - 8}$$

$$\Rightarrow 2[n] - 8 \geq 0 \Rightarrow [n] \geq 4$$

$$\Rightarrow 2[n] \geq 8 \Rightarrow [n] \geq 4$$

$$\Rightarrow [n] \geq 4$$

$$\Rightarrow D_f = [4, +\infty)$$

$$\Rightarrow [n] \geq 4$$

$$\Rightarrow n \geq 4$$

$$y = \sqrt{\frac{n+1}{|n-3|}} + \sqrt{\frac{4-n}{n^2+2n+5}}$$

$$\Rightarrow \frac{n+1}{|n-3|} \geq 0 \quad n \neq 3$$

سؤال 10 =

$$\Rightarrow n \geq -1$$

$$\Rightarrow n = [-1, +\infty) - \{3\}$$

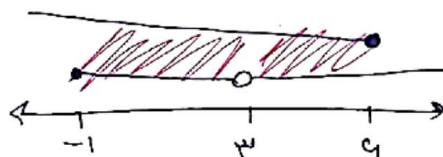
$$\Rightarrow \frac{4-n}{n^2+2n+5} \geq 0$$

$$\Rightarrow 4-n \geq 0 \Rightarrow n \leq 4$$

$$\Delta = 4 - 14 < 0 \rightarrow \text{دائمًا موجب}$$



دائمًا موجب



$$D_f = [-1, 3) \cup (3, 4]$$

$$= [-1, 4] - \{3\}$$

$$y = \sqrt{[n] - \varepsilon}$$

$$+ \sqrt{r - [n]}$$

$$\Rightarrow r - [n] \geq 0 \Rightarrow [n] \leq r$$

$$\Rightarrow n < r$$

$$\Rightarrow [n] - \varepsilon \geq 0 \Rightarrow [n] \geq \varepsilon \Rightarrow n \geq \varepsilon$$

$$\boxed{D_f = \emptyset}$$

