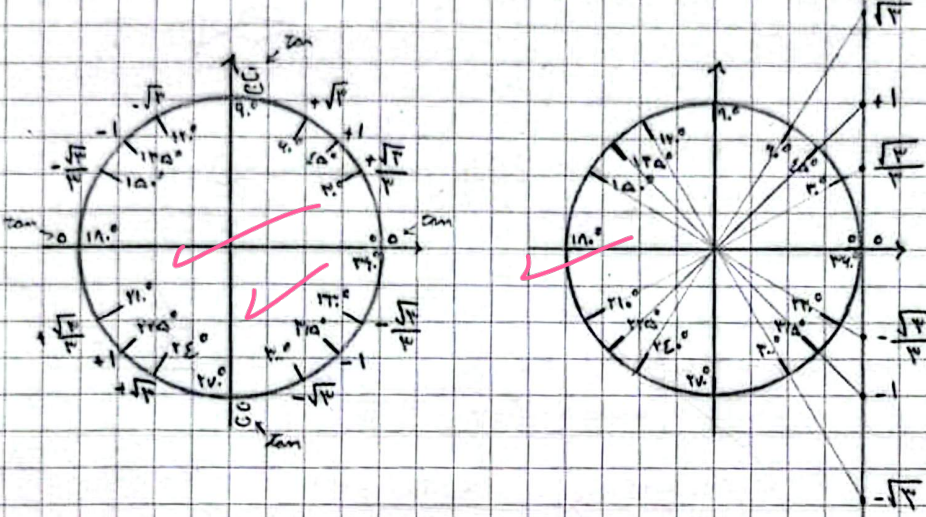


۲. آزمون خطی عالی و مرتب نوشتار

ساینا دوی تکلیف ۲ گروه یازدهم دخترانه

۱- چون مطمئن نبودم و در امتحان منظور سواله بالا بود که فقط بنویسیم، جفتش کردیم. آزمون ت



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

ب) $-\cos \frac{5\pi}{4} + \sin \frac{2\pi}{3} - 3 \sin \frac{\pi}{6} = -(-\frac{\sqrt{2}}{2}) + \frac{\sqrt{3}}{2} - 3(\frac{1}{2}) = \frac{\sqrt{2} + \sqrt{3} - 3}{2}$

ج) $\cot \frac{2\pi}{3} + 3 \cot \frac{\pi}{6} - 2 \tan \frac{5\pi}{4} = -\frac{\sqrt{3}}{3} + 3(\frac{\sqrt{3}}{3}) - 2(-\frac{\sqrt{2}}{2}) = \frac{\sqrt{3} + 2\sqrt{2}}{3}$

د) $\cos(\sin x) + \sin(\pi \cos \frac{\pi}{4}) = \cos(0) + \sin(\pi \cdot \frac{1}{2}) = \cos(0) + \sin(\frac{\pi}{2}) = 1 + 1 = 2$

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

(a > 0)

$$a^2 + \varepsilon a = 2a + a + \varepsilon \rightarrow a^2 + a - \varepsilon = 0$$

$$\rightarrow (a + \varepsilon)(a - 1) = 0 \rightarrow a = -\varepsilon, 1$$

$$\rightarrow a = 1$$

$$f(1) = 2(1) + 1 + \varepsilon = 3 + \varepsilon$$

$$1(1)^2 + \varepsilon(1) = 1 + \varepsilon$$

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

$$|x+1| \geq 2 \rightarrow x+1 \geq 2, x+1 \leq -2 \rightarrow x \geq 1, x \leq -3$$

$$2(-3)^2 - b = a + 2(-3) \rightarrow 18 - b = a - 4 \rightarrow a + b = 22$$

$$a + b = 22$$

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

$$x^2 - \varepsilon x^2 \neq 0 \rightarrow x^2(x - \varepsilon) = 0 \rightarrow x^2 = 0 \rightarrow x = 0, x - \varepsilon = 0 \rightarrow x = \varepsilon$$

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

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

$$2x^3 + \varepsilon x^2 + 2x + \varepsilon \neq 0 \rightarrow 2(x^3 + \frac{\varepsilon}{2}x^2 + x + \frac{\varepsilon}{2}) \neq 0 \rightarrow x^3 + \frac{\varepsilon}{2}x^2 + x + \frac{\varepsilon}{2} \neq 0 \rightarrow (x + \frac{\varepsilon}{2})(x^2 + 1) = 0$$

$$\rightarrow x + \frac{\varepsilon}{2} = 0 \rightarrow x = -\frac{\varepsilon}{2}, x^2 + 1 = 0 \rightarrow x^2 = -1$$

$$D = \mathbb{R} - \{-\frac{\varepsilon}{2}\}$$

s.a.m

تمرین: ۱) ۲) ۳) استاد عزیز به جای د فانی ت

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

$x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1 \vee x \leq -1$ (I)
 $x - 2 \geq 0 \rightarrow x \geq 2$ (II)

$I \cap II \rightarrow \mathcal{D} = [2, +\infty)$

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

$4 - 3x \geq 0 \rightarrow 3x \leq 4 \rightarrow x \leq \frac{4}{3}$ (I)
 $4x - 3 \geq 0 \rightarrow 4x \geq 3 \rightarrow x \geq \frac{3}{4}$ (II)

$I \cap II \rightarrow \frac{3}{4} \leq x \leq \frac{4}{3} \rightarrow \mathcal{D} = [\frac{3}{4}, \frac{4}{3}]$

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

$4x - a \geq 0 \rightarrow 4x \geq a \rightarrow x \geq \frac{a}{4}$
 $b - 3x \geq 0 \rightarrow 3x \leq b \rightarrow x \leq \frac{b}{3}$

$\mathcal{D} = \{1\}$

$\frac{a}{4} = \frac{b}{3} \rightarrow 3a = 4b$
 $(\frac{3}{4}, \frac{4}{3}) \rightarrow b = 4, a = 12$

$\mathcal{D} = [\frac{a}{4}, \frac{b}{3}] \rightarrow \frac{a}{4} = \frac{b}{3} = 1 \rightarrow a = 12, b = 4 \rightarrow \frac{4}{12} = \frac{1}{3}$

$\frac{b}{a} = \frac{1}{3}$

الف) $y = \sqrt{\frac{x^2 - x - 4}{x^2 - 13x^2 + 34}}$

$\frac{x^2 - x - 4}{x^2 - 13x^2 + 34} \geq 0 \rightarrow \frac{(x - 3)(x + 2)}{(x - 9)(x - 2)} \geq 0 \rightarrow \frac{(x - 3)(x + 2)}{(x - 9)(x + 3)(x - 2)(x + 2)} \geq 0$
 $+\frac{+}{-} - \frac{+}{-} - \frac{+}{-} + \frac{+}{-} +$

$\mathcal{D} = (-\infty, 3) \cup (2, 9) \cup (9, +\infty)$
 $\cup (-\infty, -3) \cup (2, +\infty) - \{3\}$

ب) $y = \sqrt{\frac{x^2 - 2x^2 - 5x + 4}{x^2 + 2x^2 - 5x - 4}}$

$\frac{x^2 - 2x^2 - 5x + 4}{x^2 + 2x^2 - 5x - 4} \geq 0 \rightarrow \frac{(x - 1)(x - 3)(x + 2)}{(x - 2)(x + 1)(x + 3)} \geq 0$
 $+\frac{+}{-} - \frac{+}{-} + \frac{+}{-} - \frac{+}{-} + \frac{+}{-} - \frac{+}{-} +$

$\mathcal{D} = (-\infty, -3) \cup (-2, -1) \cup [1, 2) \cup [3, +\infty)$

الف) $y = \sqrt{2[x] - 8}$

$2[x] - 8 \geq 0 \rightarrow 2[x] \geq 8 \rightarrow [x] \geq 4 \rightarrow x \geq 4 \rightarrow \mathcal{D} = [4, +\infty)$

ب) $y = \sqrt{2[x] - 5}$

$2[x] - 5 \geq 0 \rightarrow 2[x] \geq 5 \rightarrow [x] \geq \frac{5}{2} \rightarrow x \geq 3 \rightarrow \mathcal{D} = [3, +\infty)$

الف) $y = \sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+2x+8}}$

$\frac{x+1}{|x-3|} \geq 0 \rightarrow x+1 \geq 0 \rightarrow x \geq -1$
 $\frac{4-x}{x^2+2x+8} \geq 0 \rightarrow 4-x \geq 0 \rightarrow x \leq 4$
 $x^2+2x+8 = (x+1)^2+7 > 0$

$I \cap II$

$\mathcal{D} = [-1, 3) \cup (3, 4]$

ب) $y = \sqrt{[x] - 8} + \sqrt{2 - [x]}$

$[x] - 8 \geq 0 \rightarrow [x] \geq 8$
 $2 - [x] \geq 0 \rightarrow [x] \leq 2$
 $x \geq 8$
 $x \leq 2$

$\mathcal{D} = \emptyset$

این دو شرط متناقض هستند