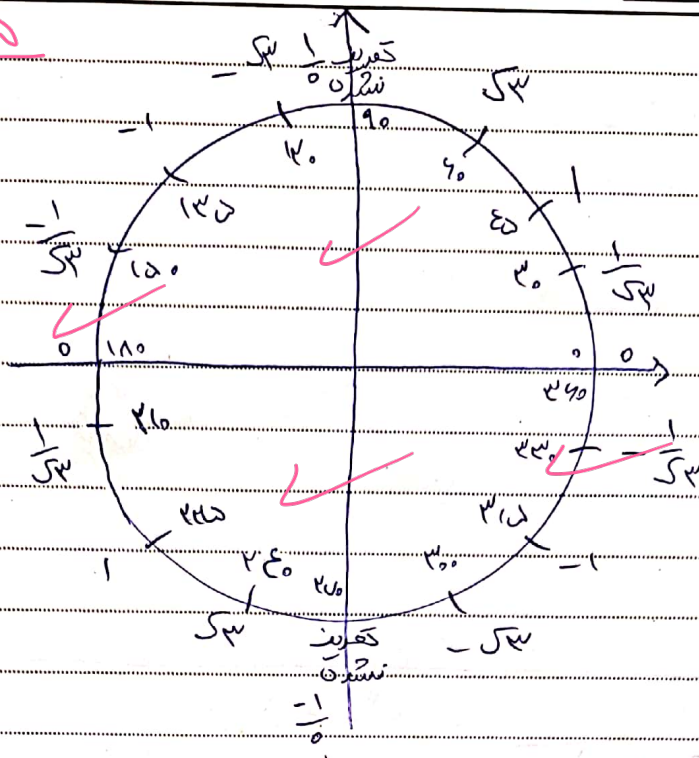


۱۹۱۷۵ آید



الف) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{3\pi}{4} = \frac{1}{2} - 1 + 2(-1) = \frac{1}{2} - 3 = -\frac{5}{2}$ ۲

ب) $1 - \cos \frac{5\pi}{4} + \sin \frac{3\pi}{4} - 3 \sin \frac{\pi}{4} = +\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - 3(-\frac{\sqrt{3}}{2})$
 $= \frac{2\sqrt{3}}{2} + \frac{3\sqrt{3}}{2} = \frac{5\sqrt{3}}{2}$ ۲

ج) $\cot \frac{\pi}{3} + 2 \cot \frac{2\pi}{3} - 3 \tan \frac{5\pi}{6} = -\frac{1}{\sqrt{3}} + 3(\frac{1}{\sqrt{3}}) - 2(-\frac{1}{\sqrt{3}})$
 $= \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$ ۲

د) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{3}) = \cos 0 + \sin \frac{\pi}{2} = 1 + 1 = 2$ ۲

$x = a, a^2 + 3a = 4a + a + 2$
 $a^2 + a - 2 = 0$

$(a + 2)(a - 1) = 0$

$a = -2$ or $a = 1$
 $a > 0$

$f(x) = \begin{cases} x^2 + 3x & x > 1 \\ 4x + 3 & x \leq 1 \end{cases}$ ۳

$f(1) = 4(1) + 3 = 7$ ۲

$4x + 3$ is a linear function
 $x^2 + 3x$ is a quadratic function

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

5 $x = -3 \rightarrow x^2 - b = a + x$

$$9 - b = a - 3$$

$$a + b = 12$$

Ⓟ

10

ii) $y = \frac{1}{x^3 - \varepsilon x^2} \rightarrow x^3 - \varepsilon x^2 \neq 0$
 $x^2(x - \varepsilon) \neq 0$
 $x \neq 0 \rightarrow x \neq \varepsilon$
 $D = \mathbb{R} - \{0, \varepsilon\}$

Ⓟ

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

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

$$x(x^2 + \varepsilon x + 1) + \varepsilon \neq 0$$

$$x(x + 1)^2 + \varepsilon \neq 0$$

$$-\varepsilon$$

$$\rightarrow x = -1$$

$$D = \mathbb{R} - \{-1\}$$

25 i) $y = \sqrt{x^2 - 1} + \sqrt{x - 2} \rightarrow x - 1 > 0 \rightarrow x > 1$ ①

$$x^2 - 1 > 0 \rightarrow x^2 > 1 \rightarrow \begin{cases} x > 1 \\ x < -1 \end{cases}$$

$$D = [x, +\infty)$$

$$① \cap ②$$

ii) $y = \frac{\sqrt{4 - x}}{\sqrt{4x - 4}} \rightarrow 4 - x > 0 \rightarrow x < 4$

$$x < 4$$

$$4x - 4 > 0 \rightarrow 4x > 4 \rightarrow x > 1$$

$$① \cap ② \rightarrow D = (1, 4]$$

Arman

$$y = \sqrt{4x-a} + \sqrt{b-3x} \rightarrow b-3x \geq 0$$

$$4x-a \geq 0$$

$$4x \geq a \rightarrow x \geq \frac{a}{4}$$

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

$$D_f = \left[\frac{a}{4}, \frac{b}{3} \right] = \{x\}$$

$$\frac{b}{a} = \frac{\frac{4}{12} = \frac{1}{3}}{\frac{4}{12} = \frac{1}{3}} \leftarrow \begin{cases} \frac{a}{4} = x \rightarrow a = 12 \\ \frac{b}{3} = x \rightarrow b = 4 \end{cases}$$

$$\text{ii) } y = \sqrt{\frac{x^3 - x - 4}{x^2 - 13x^2 + 35}}$$

$$x^3 - x - 4 = 0 \rightarrow (x+1)(x-3) = 0$$

$$x = -1$$

$$x = 3$$

$$x^2 - 13x^2 + 35 = 0$$

$$(x^2 - 4)(x^2 - 9) = 0$$

$$(x-2)(x+2)(x-3)(x+3) = 0$$

$$x = 2$$

$$x = -2$$

$$x = 3$$

$$x = -3$$

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

$$\therefore \sqrt{\frac{x^3 - x - 4}{x^2 - 13x^2 + 35}} \rightarrow \sqrt{\frac{(x-1)(x-3)(x+1)}{(x+1)(x-2)(x+3)}} \rightarrow \sqrt{\frac{(x-1)(x-3)}{(x-2)(x+3)}}$$

$$\frac{x^3 - x - 4}{x^2 - 13x^2 + 35} \div \frac{x-1}{x^2 - x - 4} = \frac{x^3 - x - 4}{x^2 - x - 4} \cdot \frac{x-1}{x-1}$$

$$\frac{-x^2 - \omega x + 4}{x^2 - x - 4}$$

$$\frac{-4x + 4}{x^2 - x - 4}$$

$$\frac{x-1}{x^2 - x - 4}$$

$$\frac{(x-3)(x+1)}{(x-2)(x+3)}$$

$$\frac{x^3 + 13x^2 - \omega x - 4}{x^2 + x - 4} \div \frac{x+1}{x^2 + x - 4} = \frac{x^3 + 13x^2 - \omega x - 4}{x^2 + x - 4} \cdot \frac{x+1}{x+1}$$

$$\frac{-x^2 - x - 4}{x^2 + x - 4}$$

$$\frac{-4x - 4}{x^2 + x - 4}$$

Arman

$$\text{الف) } y = \sqrt{x[x]-x} \rightarrow x[x]-x > 0$$

$$x[x] > x$$

$$[x] > 1 \rightarrow x > 1$$

$$D_f = [1, +\infty)$$

$$\text{ب) } y = \sqrt{x[x]-\omega} \rightarrow x[x] > \omega$$

$$[x] > \frac{\omega}{x}$$

$$[x] > 1 \frac{1}{x} \rightarrow x > 1$$

$$D_f = [1, +\infty)$$

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

$$x=-1$$

$$x=3$$

$$\frac{-1}{-6} + \frac{3}{3} + \frac{4}{-6}$$

ساده و خارج فاکتور شده است

$$\frac{[-1, +\infty) - \{3\}}{\text{در اینجا یکتا یکتا نیست!}}$$

$$\frac{-1}{-6} + \frac{3}{3} + \frac{4}{-6}$$

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

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

$$x - [x] > 0$$

$$[x]-x > 0$$

$$[x] \leq x$$

$$[x] > x \rightarrow x > x \quad \text{①} \quad x < 3 \quad \text{②}$$

$$\text{①} \cap \text{②} \Rightarrow D_f = \emptyset$$

استهلاک

(١٠-الف) $y = \sqrt{\frac{n+1}{|n-4|}} + \sqrt{\frac{4-n}{n^2+2n+2}}$

$\begin{cases} \frac{n+1}{|n-4|} \geq 0 \rightarrow n \geq -1, n \neq 4 \text{ I} \\ \frac{4-n}{n^2+2n+2} \geq 0 \rightarrow n \leq 4 \text{ II} \end{cases}$

← نقولاً مقدرية مفرجة!
 ← $\Delta < 0$ ، معماره مثبت و بدون مقدرية

$I \cap II \rightarrow D_f = [-1, 4) \cup (4, 4] \subseteq [-1, 4] - \{4\}$