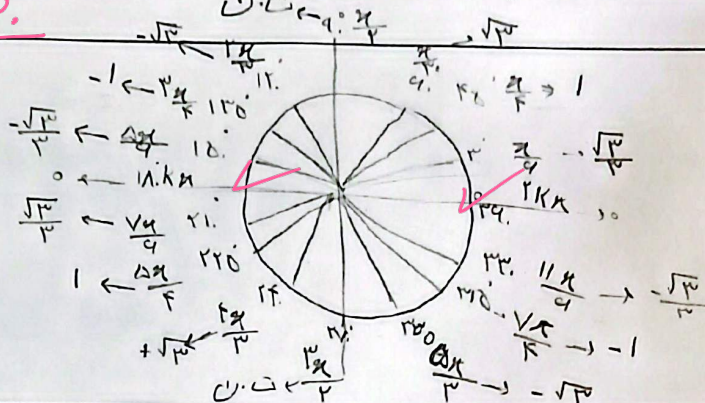


۲. افین خوبتر!



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

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

ج) $\cot \frac{\pi}{4} + 2 \cot \frac{\pi}{4} - \tan \frac{3\pi}{4} = \left(-\frac{1}{\sqrt{3}}\right) + 2\left(\frac{1}{\sqrt{3}}\right) - \left(\frac{1}{\sqrt{3}}\right) = \frac{1}{\sqrt{3}}$

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

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$$a^2 + fa = \frac{f(a+a)}{fa} + 2$$

$$a^2 + a - 2 = 0 \rightarrow (a+2)(a-1) = 0$$

$$\begin{cases} x^2 + 2x & x \geq 1 \\ 2x + 2 & x < 1 \end{cases}$$

$$x=1 \rightarrow f(1) = \frac{1+2}{1+2} = 1$$

$$\frac{a-2}{a-1} = 1 \rightarrow a=1$$

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

$$x = -3 \Rightarrow 1x \left(\frac{-3}{1}\right) - b = a+2(-3)$$

$$11 - b = -9 + a \rightarrow a + b = 20$$

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الف) $\frac{1}{x^2 - 4x^2} \Rightarrow x^2 - 4x^2 \neq 0 \Rightarrow x^2(x-4) \neq 0$

$$x=0, x=4$$

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ب) $\frac{1}{2x^3 + 4x^2 + 2x + 2} = 0$

$$2x^3 + 4x^2 + 2x + 2 = 0 \Rightarrow 2(x^3 + 2x^2 + x + 1) = 0$$

$$(x^3 + 2x^2 + x + 1) = 0$$

$$x^2(x+2) + (x+1) = 0 \Rightarrow (x+2)(x^2+1) = 0$$

$$(x+2) = 0$$

$$x = -2$$

$$x^2 = -1$$

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الف) $y = \sqrt{x^2-1} + \sqrt{x-2} \rightarrow x^2-1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow \begin{cases} x \geq 1 \\ x \leq -1 \end{cases} \rightarrow \begin{cases} x-2 \geq 0 \rightarrow x \geq 2 \end{cases} \Rightarrow [2, +\infty)$

ب) $y = \frac{\sqrt{4-2x}}{\sqrt{4x-2}} \rightarrow \begin{cases} 4-2x \geq 0 \rightarrow 2x \leq 4 \rightarrow x \leq 2 \\ 4x-2 > 0 \rightarrow 4x > 2 \rightarrow x > \frac{1}{2} \end{cases} \Rightarrow x \in (\frac{1}{2}, 2]$

$y = \sqrt{4x-a} + \sqrt{b-2x}$

$D_f = [2]$ فقط $x=2$ على x من أجل أن

$\sqrt{4(2)-a} + \sqrt{b-2(2)}$

$12-a=0 \rightarrow a=12 \quad b-4=0 \rightarrow b=4 \quad \frac{b}{a} = \frac{4}{12} = \frac{1}{3}$

الف) $\sqrt{\frac{x^2-x-4}{x^2-13x^2+29}} \rightarrow \begin{cases} (x-3)(x+1) \rightarrow x=3 \\ x=-1 \end{cases} \quad \begin{cases} x^2-13x^2+29 \end{cases} \rightarrow x^2=9 \rightarrow x=\pm 3$

ب) $\sqrt{\frac{x^3-2x^2-\Delta x+4}{x^3+2x^2-\Delta x-4}} \rightarrow \begin{cases} x^3-2x^2-\Delta x+4 \\ x^3+2x^2-\Delta x-4 \end{cases} \Rightarrow \begin{cases} x^3-2x^2-\Delta x+4 \\ x^3+2x^2-\Delta x-4 \end{cases} \Rightarrow D_f = (-\infty, -2) \cup (2, 3) \cup (3, +\infty)$

الف) $y = \sqrt{2[x]-4} \Rightarrow 2[x]-4 \geq 0 \rightarrow 2[x] \geq 4 \rightarrow [x] \geq 2 \rightarrow x \in [2, +\infty)$

ب) $y = \sqrt{2[x]-\Delta} \Rightarrow 2[x]-\Delta \geq 0 \rightarrow 2[x] \geq \Delta \rightarrow [x] \geq \frac{\Delta}{2} \rightarrow x \in [\frac{\Delta}{2}, +\infty)$

الف) $\sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+2x+5}} \Rightarrow \begin{cases} 4-x \geq 0 \rightarrow x \leq 4 \\ \frac{x+1}{|x-3|} \end{cases} \Rightarrow [-1, 3) \cup (3, +\infty) \cap [-1, 4] \Rightarrow [-1, 3) \cup (3, 4]$

ب) $y = \sqrt{2x-4} + \sqrt{2-[x]} \Rightarrow \begin{cases} 2x-4 \geq 0 \rightarrow [x] \geq 2 \rightarrow [2, +\infty) \\ 2-[x] \geq 0 \rightarrow [x] \leq 2 \end{cases} \Rightarrow [2, 2] = \{2\}$