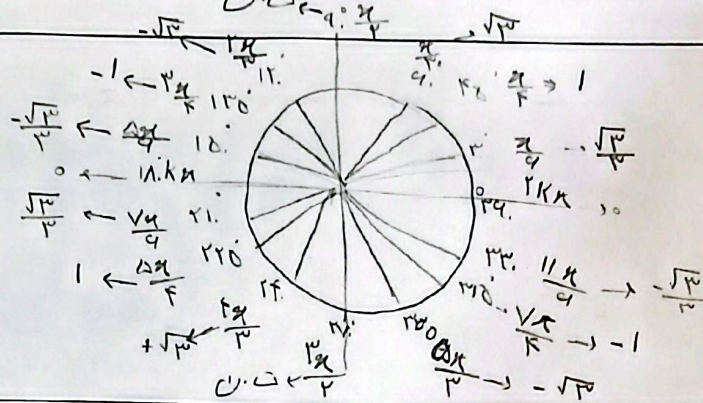




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الف) $\sin \frac{\pi}{4} + \cos \pi + \tan \frac{3\pi}{4} = \frac{1}{\sqrt{2}} + (-1) + \frac{(-1)}{1} = \frac{1}{\sqrt{2}} - 1 - 1 = \frac{1}{\sqrt{2}} - 2$

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

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

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

$a^2 + 1a = \frac{a^2 + a}{1a} + 1$

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

$a = -2, a = 1$

چون $a = 1$ و $a = -2$ در $\mathbb{Q}$ قرار دارند.

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

$x = 1 \rightarrow f(1) = \begin{cases} 1+1=2 \\ 1+2=3 \end{cases}$

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

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

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

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

$x \neq 0, x \neq 4$

$R = \{0, 4\}$

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

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

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

$x = -1$

$x^2 = -1$

$x = \pm i$

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

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

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

$D_f = [2]$ فقط $x=2$ على x من أجل أن

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

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

$$\text{الف) } \sqrt{\frac{x^2-x-4}{x^2-12x^2+29}} \rightarrow \begin{cases} (x-3)(x+1) \rightarrow x=3 \\ x=-1 \end{cases} \quad \begin{cases} (x^2-4)(x^2-4) \rightarrow x^2=4 \rightarrow x=\pm 2 \end{cases} \quad x^2=4 \Rightarrow x=\pm 2$$

$$\text{ب) } \sqrt{\frac{x^3-2x^2-\Delta x+4}{x^3+2x^2-\Delta x-4}} \Rightarrow \frac{x^3-2x^2-\Delta x+4}{x^3+2x^2-\Delta x-4} = \frac{x^3-2x^2-\Delta x+4}{x^3+2x^2-\Delta x-4} \Rightarrow \frac{x^3-2x^2-\Delta x+4}{x^3+2x^2-\Delta x-4} = \frac{x^3-2x^2-\Delta x+4}{x^3+2x^2-\Delta x-4} \Rightarrow D = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$$

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

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

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

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