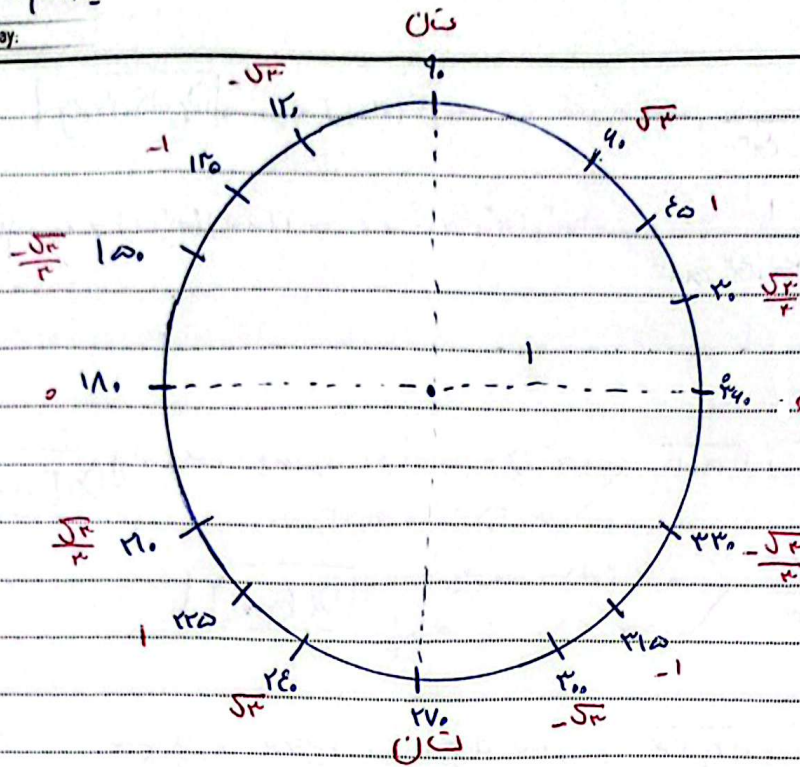




15 Cell) $\sin \frac{\pi}{4} + \cos \pi + \tan \frac{\pi}{4} \rightarrow \frac{1}{2} - 1 - 1 = \boxed{\frac{-3}{2}}$

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

2) $\cot \frac{\pi}{4} + 2 \cot \frac{\pi}{4} - 2 \tan \frac{5\pi}{4} \rightarrow \frac{-\sqrt{2}}{2} + \frac{2\sqrt{2}}{2} - \frac{2\sqrt{2}}{2} = \boxed{\frac{-\sqrt{2}}{2}}$

3) $\cos(\sin \pi) + \sin(\pi \cos \frac{\pi}{4}) \rightarrow 1 + \sin \frac{\pi}{4} = 1 + 1 = \boxed{2}$

$a^2 + a \leq 2a + a + 1 \rightarrow a^2 + a - 1 \leq 0 \rightarrow a \in \left[\frac{-1-\sqrt{5}}{2}, \frac{-1+\sqrt{5}}{2} \right]$

25 $x^2 + 6x \geq 1, 1 + x \geq \boxed{1}$

$|a+1| \geq 2 \rightarrow a+1 \geq 2 \rightarrow a \geq 1 \Rightarrow 1 \leq b = a-1 \rightarrow \boxed{a+b \geq 2}$
 $|a+1| \geq 2 \rightarrow a+1 \leq -2 \rightarrow a \leq -3$

الف) $y = \frac{1}{x^2 - 4x^2} \rightarrow x^2 - 4x^2 \neq 0 \rightarrow x^2(x-4) \neq 0 \rightarrow D_f = \mathbb{R} - \{0, 4\}$ - 5

ب) $y = \frac{1}{x^2 + 4x^2 + 4x + 4} \rightarrow x^2 + 4x^2 + 4x + 4 \neq 0 \rightarrow x(x+4)(x+1) \neq 0 \rightarrow D_f = \mathbb{R} - \{-1, -4\}$

الف) $y = \sqrt{x^2 - 1} + \sqrt{x - 1} \rightarrow x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1, x \leq -1$
 $x - 1 \geq 0 \rightarrow x \geq 1$ } $D_f = [1, +\infty)$ - 9

ب) $y = \frac{\sqrt{4-x}}{\sqrt{4x-x}} \rightarrow 4-x \geq 0 \rightarrow x \leq 4$
 $4x-x \geq 0 \rightarrow x \geq \frac{1}{3}$ } $D_f = [\frac{1}{3}, 4]$ - 10

$y = \sqrt{4x-a} + \sqrt{b-5x} \rightarrow 4x-a \geq 0 \rightarrow a \leq 4x \rightarrow \frac{a}{4} \leq x$
 $b-5x \geq 0 \rightarrow b \geq 5x \rightarrow \frac{b}{5} \geq x$ - 11

$\frac{a}{4} \leq x \rightarrow a \leq 4x$
 $\frac{b}{5} \geq x \rightarrow b \geq 5x \rightarrow \frac{b}{5} \geq \frac{a}{4} \rightarrow \frac{b}{a} \geq \frac{5}{4} \rightarrow \frac{b}{a} \geq \frac{5}{4}$ - 12

الف) $y = \sqrt{\frac{x^2 - 4x + 4}{x^2 - 11x + 44}} \rightarrow \frac{(x-2)(x-2)}{(x-2)(x-11)} \geq 0 \rightarrow \frac{x-2}{x-11} \geq 0 \rightarrow (x-2)(x-11) \geq 0$
 $x^2 - 11x + 44 \geq 0 \rightarrow (x-4)(x-11) \geq 0$
 $x \leq 4$ or $x \geq 11$
 $x \neq 2$
 $D_f = (-\infty, 2) \cup (2, 4] \cup [11, +\infty)$ - 13

ب) $y = \sqrt{\frac{x^2 - 12x^2 - 42x + 4}{x^2 + 12x^2 - 42x - 4}} \rightarrow \frac{(x-1)(x-12)(x+1)}{(x+1)(x+12)(x-2)} \geq 0$
 $\frac{(x-1)(x-12)}{(x+12)(x-2)} \geq 0$
 $\frac{x-1}{x-2} \geq 0$
 $x \leq 1$ or $x \geq 2$
 $D_f = (-\infty, 1] \cup [2, +\infty)$ - 14

الف) $y = \sqrt{[x] - 2} \rightarrow [x] - 2 \geq 0 \rightarrow [x] \geq 2 \rightarrow [x] \geq 2 \rightarrow D_f = [2, +\infty)$ - 15

ب) $y = \sqrt{[x] - \omega} \rightarrow [x] - \omega \geq 0 \rightarrow [x] \geq \omega \rightarrow [x] \geq 2, \omega \rightarrow D_f = [2, +\infty)$ - 16

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

$$\frac{x+1}{|x-1|} \geq 0 \rightarrow x \geq -1 \rightarrow [-1, +\infty) \setminus \{1\}$$

$$\frac{4-x}{x^2+x+1} \geq 0 \rightarrow 4-x \geq 0 \rightarrow x \leq 4 \rightarrow (-\infty, 4]$$

$$x^2+x+1 \rightarrow (x+1)^2 + 1 \rightarrow +\infty$$

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

$$\text{ب) } \sqrt{[x]-1} + \sqrt{1-[x]}$$

$$[x]-1 \geq 0 \rightarrow [x] \geq 1 \rightarrow x \geq 1 \rightarrow [1, +\infty)$$

$$1-[x] \geq 0 \rightarrow [x] \leq 1 \rightarrow x < 2 \rightarrow (-\infty, 2)$$

$$\} D_f = \emptyset$$