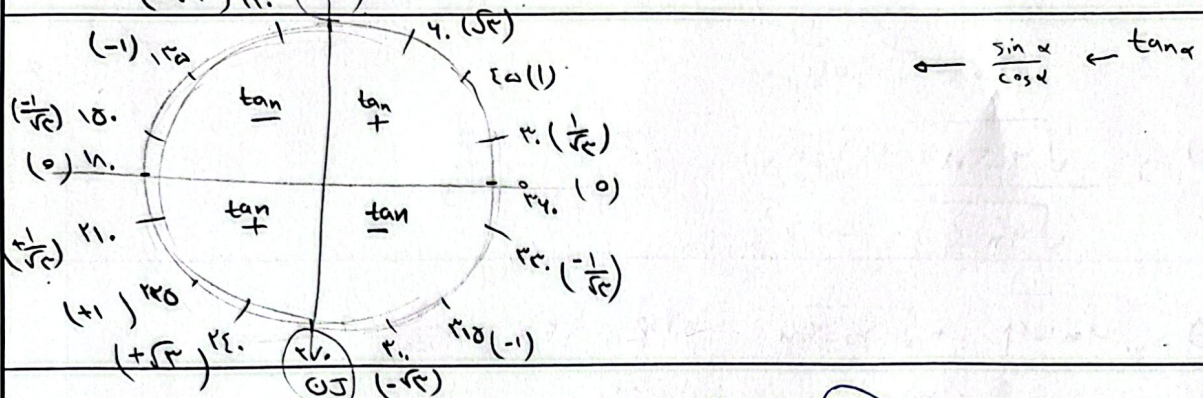




۱) $\sin \frac{\pi}{4} + \cos \frac{\pi}{4} + 2 \tan \frac{\pi}{4} \rightarrow \frac{1}{\sqrt{2}} + (-1) + (2 \times -1) = \left(-\frac{8}{\sqrt{2}} \right)$

۲) $-\cos \frac{\pi}{4} + \sin \frac{\pi}{4} - 2 \sin \frac{\pi}{4} \rightarrow \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} - (2 \times \frac{\sqrt{2}}{2}) \rightarrow \frac{\sqrt{2}}{2} + \frac{\sqrt{2}}{2} - \sqrt{2} = \left(\frac{0\sqrt{2}}{2} \right)$

۳) $\cot \frac{\pi}{4} + 2 \cot \frac{\pi}{4} - 2 \tan \frac{\pi}{4} \rightarrow \frac{1}{\sqrt{2}} + (2 \times \frac{1}{\sqrt{2}}) - (2 \times \frac{1}{\sqrt{2}}) = \frac{1}{\sqrt{2}} + \frac{2}{\sqrt{2}} - \frac{2}{\sqrt{2}} = \left(\frac{1}{\sqrt{2}} \right)$

۴) $\cos \left(\frac{\pi}{2} \right) + \sin \left(\frac{\pi}{2} \right) \rightarrow 1 + 1 = 2$

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

$a \rightarrow a^2 + 2a = 2a + a + 2$

$a^2 + a - 2 = 0$

$\frac{1}{2} = \frac{1}{2}$

$I \cap II \rightarrow a = 1 \rightarrow 1^2 + 2(1) = 3$

$f(n) = \begin{cases} 2n^2 - b \\ a + 2n \end{cases}$

$(n+1) \geq 2$
 $-3 \leq n \leq -1$

$a + b = ?$

$n+1 \geq 2 \rightarrow n \geq 1$

$n+1 \leq -1 \rightarrow n \leq -2$

$a - 4 = 12 - b$

$a + b = 16$

$\frac{1}{2} = \frac{1}{2}$

۱) $y = \frac{1}{n^2 - 2n^2} \rightarrow n^2 (n-2) \neq 0 \rightarrow D_f = \mathbb{R} - \{0, 2\}$

۲) $y = \frac{1}{2n^2 + 2n^2 + 2n + 2} \rightarrow 2(n^2 + n^2 + n + 1) \rightarrow 2(n^2(n+1) + (n+1)) \rightarrow (n+1)(n^2+1) \times 2$

الف) $y = \sqrt{x^2 - 1} + \sqrt{x - 2} - x - 2$ $x^2 \geq 1 \rightarrow \frac{-1 \pm 1}{+0 - 0} \rightarrow \{x \geq 1\} \cap \{x \geq 2\} \rightarrow D_f = [2, +\infty)$ $I = (-\infty, -1] \cup [1, +\infty)$ ب) $y = \frac{\sqrt{4 - 5x} + \sqrt{2x}}{\sqrt{4x - 5}} \rightarrow \begin{cases} 2 \geq x \\ x \geq \frac{5}{4} \end{cases} \rightarrow \frac{5}{4} \leq x \leq 2 \rightarrow D_f = [\frac{5}{4}, 2]$	6
$y = \sqrt{4x - a} + \sqrt{b - 5x} \rightarrow D_f = \{x\} \rightarrow \frac{b}{a} = ?$ $4x - a \geq 0 \quad \quad b - 5x \geq 0$ $x \geq \frac{a}{4} \quad \quad x \leq \frac{b}{5}$ $\frac{a}{4} = 2 \rightarrow a = 8 \quad \quad \frac{b}{5} = 2 \rightarrow b = 10 \rightarrow \frac{b}{a} = \frac{10}{8} = \frac{5}{4}$	7
$y = \sqrt{\frac{x^2 - x - 4}{x^2 - 13x^2 + 44}} \rightarrow (x - 4)(x + 1)$ $x^2 - 13x^2 + 44 \rightarrow (x^2 - 9)(x^2 - 4) \rightarrow (x - 3)(x + 3)(x - 2)(x + 2)$ $\frac{-2}{+3} \rightarrow D_f = (-\infty, -3) \cup (-2, +\infty)$ $y = \sqrt{\frac{x^2 - 2x^2 + 4 - 2x}{x^2 + x^2 - 2x - 4}} \rightarrow \frac{(x - 1)(x + 2)(x - 2)}{(x + 1)(x - 1)(x + 3)}$ $D_f = (-\infty, -3) \cup (-2, -1) \cup [1, 2] \cup [3, +\infty)$	8
$y = \sqrt{2[x] - 8} \rightarrow [x] \geq 4 \rightarrow D_f = [4, +\infty)$ $y = \sqrt{2[x] - 8} \rightarrow [x] \geq \frac{8}{2} \rightarrow x \geq 4 \rightarrow D_f = [4, +\infty)$	9
الف) $y = \sqrt{\frac{x+1}{x-2}} + \sqrt{\frac{x-1}{x^2+2x+2}}$ $\frac{x+1}{x-2} \geq 0 \rightarrow x \geq 2 \text{ or } x < -1$ $\frac{x-1}{x^2+2x+2} \geq 0 \rightarrow x \geq 1 \text{ or } x < -2$ $D_f = (-\infty, -2) \cup [1, 2]$ ب) $y = \sqrt{[x] - 4} + \sqrt{2 - [x]}$ $[x] \geq 4 \text{ and } 2 - [x] \geq 0 \rightarrow [x] \leq 2$ $D_f = \emptyset$	10

