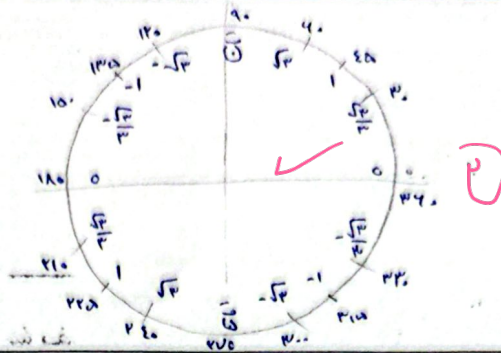




الف) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{3\pi}{4} = \frac{1}{\sqrt{2}} + (-1) + 2(-1) = \frac{1-2-2}{\sqrt{2}} = -\frac{3}{\sqrt{2}}$

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

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

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

$$\begin{cases} x^2 + 2x & n \geq a \\ 2x + a + 2 & n \leq a \end{cases} \Rightarrow a^2 + 2a = 2a + a + 2 \rightarrow a^2 + a - 2 = 0 \xrightarrow{a+b+c=0} \boxed{a=1}, a=-2$$

$f(1) = 2(1) + 1 + 2 = 5$

$$f(n) = \begin{cases} 2n^2 - b & |x+1| \geq 2 \\ a + 2x & -2 \leq n \leq -1 \end{cases} \rightarrow n = -3 \rightarrow 1a - b = a - 4 \rightarrow a - b = 4$$

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

ب) $y = \frac{1}{2x^2 + 4x^2 + 2x + 2} = \frac{1}{2x(x^2 + 2x + 1) + 2} = \frac{1}{2x(x+1)^2 + 2}$

$\rightarrow 2x(x+1)^2 \neq -2 \rightarrow x \neq -2 \rightarrow D_f = \mathbb{R} - \{-2\}$

الف) $\sqrt{x^2-1} + \sqrt{x-1} \rightarrow x^2-1 \geq 0 \rightarrow (x-1)(x+1) \geq 0 \rightarrow \frac{1}{x-1} \rightarrow (-\infty, -1] \cup (1, +\infty)$ $\hookrightarrow x-1 \geq 0 \rightarrow x \geq 1 \Rightarrow D_f = [1, +\infty)$ P ب) $\frac{\sqrt{4-3x}}{\sqrt{4x-3}} \rightarrow 4-3x \geq 0 \rightarrow 3x \leq 4 \rightarrow x \leq \frac{4}{3}$ $\hookrightarrow 4x-3 \geq 0 \rightarrow 4x \geq 3 \rightarrow x \geq \frac{3}{4}$ P $D_f = [\frac{3}{4}, \frac{4}{3}]$	6
$4x-a \geq 0 \rightarrow a \leq 4x \rightarrow x \geq \frac{a}{4}$ $b-3x \geq 0 \rightarrow 3x \leq b \rightarrow x \leq \frac{b}{3}$ $\frac{a}{4} \leq x \leq \frac{b}{3} \xrightarrow{D_f = \{x\}} \frac{a}{4} = 1 \rightarrow a = 4, \quad \frac{b}{3} = 1 \rightarrow b = 3$ $\frac{b}{a} = \frac{3}{4} = \frac{1}{\frac{4}{3}}$ P	7
الف) $y = \sqrt{\frac{x^2-x-4}{x^2-13x^2+34}} = \sqrt{\frac{(x^2-4)(x+1)^{-2}}{(x^2-9)(x^2-2)}} \xrightarrow{\pm 1} \frac{-2}{\frac{1}{1}-\frac{1}{9}-\frac{1}{2}+\frac{1}{2}} = \frac{-2}{\frac{1}{1}-\frac{1}{9}-\frac{1}{2}+\frac{1}{2}}$ $D_f = (-\infty, -3) \cup (3, 4) \cup (4, +\infty)$ P ب) $y = \sqrt{\frac{x^2-2x^2-2x+4}{x^2+2x^2-2x-4}} = \sqrt{\frac{(x-1)(x^2-x-4)}{(x+1)(x^2+x-4)}} = \sqrt{\frac{(x-1)(x^2-4)(x+1)^{-2}}{(x+1)(x+3)(x-2)^2}}$ $\frac{-2}{\frac{1}{1}-\frac{1}{1}-\frac{1}{3}+\frac{1}{2}} \rightarrow D_f = (-\infty, -3) \cup [-2, 1] \cup [1, 2) \cup (3, +\infty)$ P	8
الف) $y = \sqrt{2[x]-2} \rightarrow 2[x]-2 \geq 0 \rightarrow 2[x] \geq 2 \rightarrow [x] \geq 1 \rightarrow D_f = [1, +\infty)$ P ب) $y = \sqrt{2[x]-2} \rightarrow 2[x]-2 \geq 0 \rightarrow 2[x] \geq 2 \rightarrow [x] \geq 1 \rightarrow x \geq 1$ $\rightarrow D_f = [1, +\infty)$ P	9
الف) $y = \sqrt{\frac{n+1}{1n+1}} + \sqrt{\frac{4-n}{n^2+n+2}} \rightarrow \frac{n+1}{1n+1} \geq 0 \rightarrow n \geq -1, n \neq -2, \frac{4-n}{n^2+n+2} \geq 0 \rightarrow n \leq 4$ $D_f = [-1, 4] \setminus \{-2\}$ P ب) $y = \sqrt{[n]-2} + \sqrt{4-[n]} \rightarrow [n]-2 \geq 0 \rightarrow [n] \geq 2 \rightarrow n \geq 2$ $\hookrightarrow 4-[n] \geq 0 \rightarrow [n] \leq 4 \rightarrow n < 5$ P $D_f = \emptyset$	10