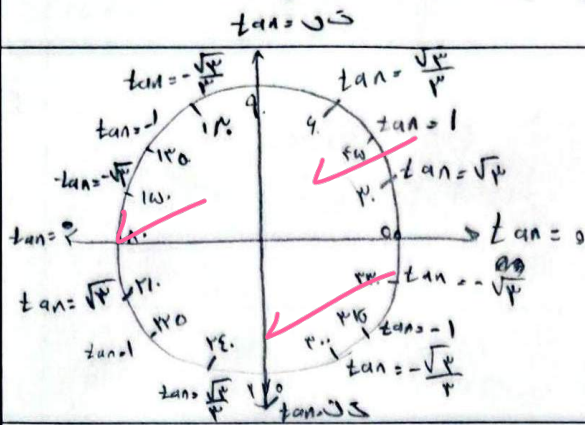




۲

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

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

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

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

$f(x) = \begin{cases} x^2 + 2x & x \geq a \\ 2x + a + 2 & x < a \end{cases}$ $\frac{a-a}{x=a} \rightarrow a^2 + 2a = 2a + a + 2 \rightarrow a^2 + a - 2 = 0$
 $(a-1)(a+2) = 0$
 غلط $a = -2$ ✓ $a = 1$ ✓

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

$f(x) = \begin{cases} 2x^2 - b & |x+1| \geq 2 \\ a + 2x & -2 \leq x \leq -1 \end{cases}$ $\frac{x \geq 0 \rightarrow x \geq 1}{x < 0 \rightarrow x \leq -2}$ $x = -2, 1 \cdot 1 - b = a + 2 \rightarrow 1 - b = a + 2$

$\rightarrow 1 - b = a + 2 \rightarrow a + b = -1$

$g = \frac{1}{x^2 - 2x^2} \rightarrow x^2(x-2) \neq 0 \rightarrow x \neq 0, 2$

$g = \frac{1}{2x^2 + 2x + 1} \rightarrow \frac{1}{2(x^2 + x + \frac{1}{2})} \rightarrow \frac{1}{2((x+\frac{1}{2})^2 + \frac{1}{4})}$

$P_f = 18 - 9 = 9$

$$y = \sqrt{x^2 - 1} + \sqrt{x - 2} \rightarrow D_f = [2, +\infty)$$

$$x^2 - 1 \geq 0 \rightarrow x \geq 1$$

$$x - 2 \geq 0 \rightarrow x \geq 2$$

$$y = \frac{\sqrt{4 - 3x}}{\sqrt{4x - 3}} \rightarrow 4 \geq 3x \rightarrow x \leq \frac{4}{3}$$

$$\sqrt{4x - 3} \rightarrow 4x \geq 3 \rightarrow x \geq \frac{3}{4}$$

$$y = \sqrt{4x - a} + \sqrt{b - 3x}$$

$$4x \geq a \rightarrow x \geq \frac{a}{4}$$

$$b \geq 3x \rightarrow \frac{b}{3} \geq x$$

وقتی باشد
یک عضو یکتا
فقط در ۲ مشترک هستند

$$\frac{a}{4} = 2 \rightarrow a = 8$$

$$\frac{b}{3} = 2 \rightarrow b = 6$$

$$\frac{b}{a} = \frac{6}{8} = \frac{3}{4}$$

$$الف) y = \sqrt{\frac{x^2 - x - 6}{x^3 - 13x^2 + 34x}} = \sqrt{\frac{(x+2)(x-3)}{(x-1)(x-2)(x-9)}}$$

$$\frac{-3}{+} \frac{-1}{+} \frac{2}{+} \frac{3}{+} \rightarrow (-\infty, -3) \cup (6, 9) \cup (9, +\infty)$$

$$\Rightarrow \sqrt{\frac{x^3 - 2x^2 - 5x + 6}{x^3 + 2x^2 - 5x - 6}} = \sqrt{\frac{(x-3)(x-1)(x+2)}{(x-2)(x+1)(x+3)}}$$

$$\frac{-3}{+} \frac{-1}{+} \frac{-1}{+} \frac{2}{+} \frac{3}{+} \rightarrow (-\infty, -3) \cup (-1, 2) \cup (2, +\infty)$$

$$\rightarrow D_f = (-\infty, -3) \cup (-1, 2) \cup (2, +\infty)$$

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

$$ب) y = \sqrt{2[x] - 6} \rightarrow 2[x] - 6 \geq 0 \rightarrow 2[x] \geq 6 \rightarrow [x] \geq 3 \rightarrow x \geq 3$$

$$D_f = [3, +\infty)$$

$$الف) \sqrt{\frac{x+1}{1-x-1}} + \sqrt{\frac{4-x}{x^2+2x+4}}$$

$$\frac{-1}{+} \frac{3}{+} \rightarrow (-\infty, -1) \cup (3, 4]$$

$$\frac{-1}{+} \frac{4}{+} \rightarrow (-\infty, -1) \cup (4, +\infty)$$

$$\Rightarrow \sqrt{[x] - 4} + \sqrt{2 - [x]} \rightarrow [4, +\infty) \cap (-\infty, 2] = \emptyset \rightarrow D_f = \emptyset$$