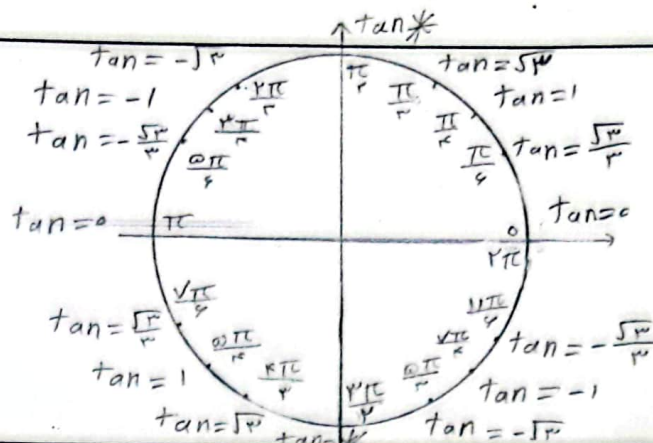




الف) $\sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{3\pi}{4}$

$\rightarrow \sin \frac{\pi}{4} + \cos \pi + 2 \tan \frac{3\pi}{4}$

$\rightarrow \frac{1}{\sqrt{2}} + (-1) + 2(-1) = -\frac{2}{\sqrt{2}}$

ب) $-\cos \frac{\pi}{4} + \sin \frac{3\pi}{4} - 3 \sin \frac{\pi}{4}$

$-\cos \frac{\pi}{4} + \sin \frac{3\pi}{4} - 3 \sin \frac{\pi}{4}$

$\rightarrow -(\frac{1}{\sqrt{2}}) + \frac{1}{\sqrt{2}} - 3(\frac{1}{\sqrt{2}}) = -\frac{2}{\sqrt{2}}$

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

$\rightarrow \cot \frac{\pi}{4} + 3 \cot \frac{3\pi}{4} - 2 \tan \frac{\pi}{4}$

$\rightarrow -\frac{\sqrt{2}}{2} + 3 \frac{\sqrt{2}}{2} - 2(1) = \frac{\sqrt{2}}{2}$

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

$\rightarrow \cos 0 + \sin \frac{\pi}{4} \rightarrow 1 + \sin \frac{\pi}{4} = \frac{2}{\sqrt{2}}$

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

$a > 0$

$f(1) = ?$

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

$a = -2$ or $a = 1$

$f(1) = 1 + 2 = 3$

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

$a + b$

If $x = -2 \Rightarrow 1a - b = a - 4$

$\Rightarrow a + b = 1a + 4 = 24$

الف) $y = \frac{1}{x^2 - 4x^2} = \frac{1}{x^2(x-4)}$

$D_f = \mathbb{R} - \{0, 4\}$

$x^2 \neq 0 \Rightarrow x \neq 0$

$x - 4 \neq 0 \Rightarrow x \neq 4$

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

$2x^2 + 4x^2 + 2x + 4$

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

$\rightarrow (2x+1)(2x+4)$

$2x+1 \neq 0$

$2x+4 \neq 0$

$x \neq -2$

$D_f = \mathbb{R} - \{-2\}$

$$a) y = \sqrt{x-1} + \sqrt{x-2}$$

$$x-1 \geq 0 \quad x-2 \geq 0$$

$$\Rightarrow (x+1)(x-1) \geq 0 \quad x \geq 2$$

$$\begin{array}{c} -1 \quad 1 \\ + \quad - \quad + \end{array}$$

$$D_f = [2, +\infty)$$

$$b) y = \frac{\sqrt{4-3x}}{\sqrt{4x-3}}$$

$$4-3x \geq 0 \quad 4x-3 \geq 0$$

$$4 \geq 3x \quad 4x \geq 3$$

$$x \leq \frac{4}{3} \quad x \geq \frac{3}{4}$$

$$D_f = \left[\frac{3}{4}, \frac{4}{3}\right]$$

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

$$D_f = \emptyset \rightarrow \text{حيث } y=0 \Rightarrow \sqrt{4x-a}=0, \sqrt{b-3x}=0$$

$$\downarrow$$

$$12-a=0 \quad b-9=0$$

$$\Rightarrow a=12 \quad \Rightarrow b=9$$

$$\frac{b}{a} = \frac{9}{12} = \frac{3}{4}$$

$$a) y = \sqrt{\frac{x^2-x-6}{x^2-13x+42}} = \sqrt{\frac{(x-3)(x+2)}{(x-3)(x+7)(x-2)(x+1)}}$$

$$\begin{array}{c} -3 \quad -2 \quad 2 \quad 7 \\ + \quad - \quad - \quad + \end{array}$$

$$D_f = (-\infty, -3) \cup (2, +\infty) - \{-3\}$$

$$b) y = \sqrt{\frac{x^3-2x^2-0x+6}{x^3+13x^2-0x-6}} = \sqrt{\frac{(x-1)(x-2)(x+3)}{(x+1)(x+3)(x-2)}}$$

$$\begin{array}{c} -3 \quad -2 \quad -1 \quad 1 \quad 2 \quad 3 \\ + \quad - \quad + \quad - \quad + \quad - \end{array}$$

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

$$a) y = \sqrt{2[x]-5}$$

$$2[x]-5 \geq 0$$

$$2[x] \geq 5$$

$$[x] \geq \frac{5}{2} \quad D_f = [3, +\infty)$$

$$x \geq 3$$

$$b) y = \sqrt{2[x]-0}$$

$$2[x]-0 \geq 0$$

$$2[x] \geq 0$$

$$[x] \geq 0$$

$$x \geq 0$$

$$D_f = [0, +\infty)$$

$$a) y = \sqrt{\frac{x+1}{x-3}} + \sqrt{\frac{4-x}{x^2+13x+42}}$$

$$\begin{array}{c} -1 \quad 3 \\ - \quad + \end{array}$$

$$\begin{array}{c} 4 \\ + \quad - \end{array}$$

$$\text{استنتاج} \rightarrow D_f = [-1, 4] - \{3\}$$

$$b) y = \sqrt{[x]-5} + \sqrt{2-[x]}$$

$$[x] \geq 5$$

$$2 \geq [x]$$

$$x \geq 5$$

$$3 \geq x$$

$$\text{استنتاج} \rightarrow D_f = \emptyset$$