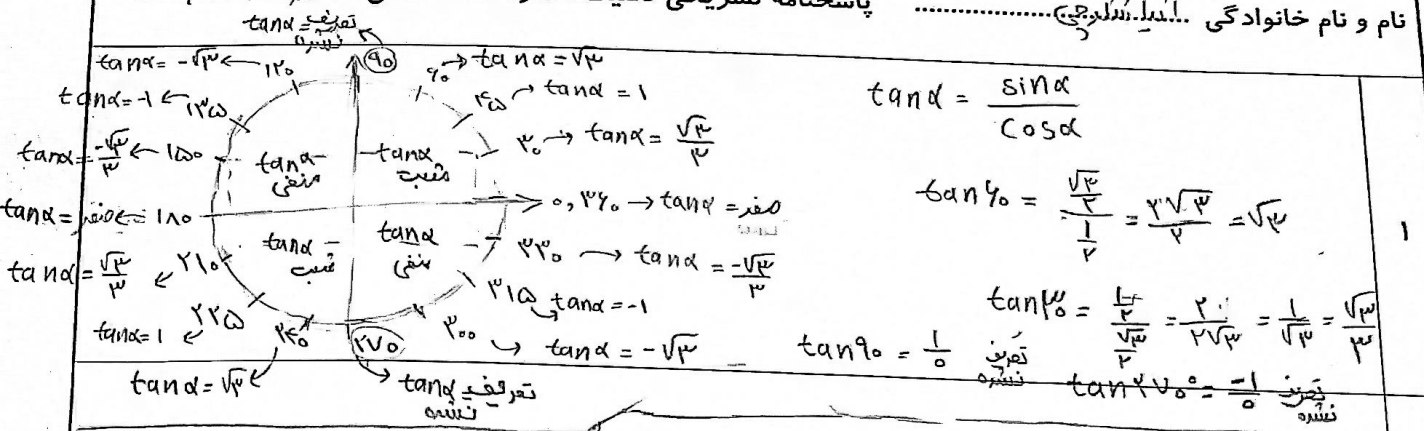




$$\tan \alpha = \frac{\sin \alpha}{\cos \alpha}$$

$$\tan 45^\circ = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{1} = \sqrt{3}$$

$$\tan 60^\circ = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \frac{\sqrt{3}}{1} = \sqrt{3}$$

$$\tan 90^\circ = \frac{1}{0} = \text{مفرد}$$

$$\tan 180^\circ = \frac{0}{-1} = 0$$

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

$$2) -\cos \frac{5\pi}{4} + \sin \frac{3\pi}{4} - 3 \sin \frac{7\pi}{4} = +\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - 3(-\frac{\sqrt{3}}{2}) = +\frac{5\sqrt{3}}{2}$$

$$3) \cot \frac{3\pi}{4} + 2 \cot \frac{5\pi}{4} - 2 \tan \frac{7\pi}{4} = -\frac{\sqrt{3}}{2} + 2(\frac{\sqrt{3}}{2}) - 2(-\frac{\sqrt{3}}{2}) = \frac{3\sqrt{3}}{2}$$

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

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

$$x^2 + 2x = 2x + a + 2 \quad a > 0$$

$$x^2 + 2x - 2x - a - 2 = 0$$

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

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

$$f(1) = 2 + 1 + 2 = 5 \quad \text{جواب آخر}$$

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

$$a + b = ?$$

$$x = -3$$

$$2 \times 9 - b = a + 2(-3)$$

$$18 - b = a - 6$$

$$a + b = 24$$

$$1) y = \frac{1}{x^3 - 2x^2}$$

$$x^3 - 2x^2 \neq 0$$

$$x^2(x-2) \neq 0 \rightarrow x \neq 0, 2 \rightarrow \mathbb{R} - \{0, 2\}$$

$$2) y = \frac{1}{2x^3 + 2x^2 + 2x + 2}$$

$$2x^3 + 2x^2 + 2x + 2 \neq 0$$

$$2(x^3 + x^2 + x + 1) \neq 0$$

$$2(x^2(x+1) + (x+1)) = 2(x+1)(x^2+1)$$

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

ملاحظه: $x^2 + 1 > 0$ و $x \neq -2$

$$\text{الف) } y = \sqrt{x^2-1} + \sqrt{x-2}$$

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

$$x-2 \geq 0 \quad x \geq 2 \rightarrow [2, +\infty) \text{ II}$$

$$(-\infty, -1] \cup [1, +\infty) \text{ I}$$

$$\text{المجال} \rightarrow I \cap II \rightarrow Df : [2, +\infty)$$

$$\text{ب) } y = \frac{\sqrt{4-x^2}}{\sqrt{4x-4}}$$

$$4-x^2 \geq 0 \quad 4 \geq x^2 \quad 2 \geq x$$

$$4x-4 > 0 \quad 4x > 4 \quad x > 1 \Rightarrow \frac{1}{x} < 1$$

$$\Rightarrow \text{المجال} : (\frac{1}{4}, 2]$$

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

$$\frac{b}{a} = \frac{4}{14} = \frac{1}{4}$$

$$4x^2-a=0$$

$$b-4x^2=0$$

$$14=a$$

$$b=4$$

$$(x-3)(x+2)$$

$$\text{الف) } \sqrt{\frac{x^2-x-6}{x^2-13x+42}}$$

$$t^2-13t+42=0$$

$$(t-7)(t-6)=0 \rightarrow t=7, 6$$

$$=x^2=4 \leq 9 \rightarrow x < \pm 3$$

$$Df : (-\infty, -3) \cup (2, 3) \cup (7, +\infty)$$

$$\text{ب) } \sqrt{\frac{x^3-13x^2-5x+4}{x^4+13x^2-5x-4}} \rightarrow (x-1) \sqrt{\frac{(x-1)(x^2-x-4)}{(x+1)(x^2+x-4)}}$$

$$Df = (-\infty, -3) \cup (-1, 1) \cup [2, 3) \cup [7, +\infty)$$

$$(x+3)(x-4)$$

$$\text{الف) } y = \sqrt{2[x]-4}$$

$$2[x] \geq 4 \quad [x] \geq 2 \quad 2 \leq x, \dots$$

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

$$\text{ب) } y = \sqrt{2[x]-5}$$

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

$$2[x] \geq 5$$

$$[x] \geq \frac{5}{2} = 2.5$$

$$Df = [2.5, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+2x+1}}$$

$$Df : [-1, 3) \cup (3, 4]$$

$$\Delta < 0$$

$$\begin{pmatrix} x+1 \geq 0 \\ x \geq -1 \\ x \neq 3 \end{pmatrix}$$

$$\begin{pmatrix} 4-x \geq 0 \\ x \leq 4 \end{pmatrix}$$

$$\text{ب) } y = \sqrt{[x]-4} + \sqrt{4-[x]}$$

$$[x] \geq 4$$

$$[x] \geq 4 \Rightarrow [4, +\infty)$$

$$4 \geq [x]$$

$$(-\infty, 4)$$

$$Df = \emptyset$$