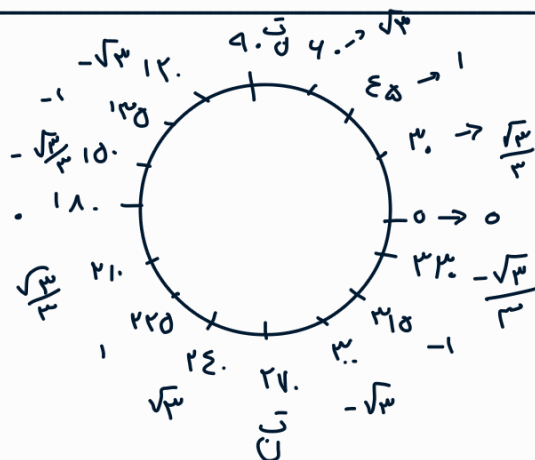




$$\tan = \frac{\sin}{\cos}$$

-1

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

2

ب) $\frac{\sqrt{3}}{\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{3}} - \frac{2 \times \sqrt{3}}{\sqrt{3}} = \frac{-\sqrt{3}}{\sqrt{3}}$

ج) $\cot \frac{2\pi}{3} = \cot 120^\circ = -\frac{\sqrt{3}}{3} \rightarrow -\frac{\sqrt{3}}{3} + \sqrt{3} - 2\sqrt{3} = \frac{\sqrt{3} + 2\sqrt{3} - 4\sqrt{3}}{3} = \frac{-\sqrt{3}}{3}$
 $\cot \frac{2\pi}{3} = \cot 120^\circ = \frac{\sqrt{3}}{3}$
 $\tan \frac{\pi}{4} = \tan 45^\circ = 1$

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

$a^2 + 6a = 2a + a + 1 \quad a^2 + a - 2 = 0 \quad (a-1)(a+2) = 0 \rightarrow a = 1$

$f(1) = 1^2 \quad g(1) = 2$

$|x+1| \geq 2 \rightarrow x+1 \geq 2 \rightarrow x \geq 1, \quad x+1 \leq -2 \rightarrow x \leq -3$

-2

if $x = -3 \rightarrow 2x^2 - b = a + 2x \rightarrow 18 - b = a - 6$

$a + b = 24$

$$y = \frac{1}{x^3 - 2x^2} \longrightarrow x^3 - 2x^2 = x^2(x-2) \quad \begin{matrix} x \neq 0 \\ x \neq 2 \end{matrix} \quad D_f = \mathbb{R} - \{0, 2\} \quad -\infty$$

$$y = \frac{1}{2x^3 + 5x^2 + 2x + 2} \longrightarrow 2x^3 + 5x^2 + 2x + 2 \longrightarrow 2(x^3 + 2x^2 + x + 1) \quad D_f = \mathbb{R} - \{-2\}$$

$$2(x+1)(x^2+1) \quad x \neq -2,$$

مشتق

$$\text{الف)} \quad x^2 - 1 \geq 0 \longrightarrow x^2 \geq 1 \longrightarrow x \geq 1, x \leq -1 \quad D_f = (-\infty, -1] \cup [1, +\infty) \quad -2$$

$$x - 2 \geq 0 \longrightarrow x \geq 2 \xrightarrow{\text{استدلال}} = [2, +\infty)$$

$$\text{ب)} \quad 4 - 2x \geq 0 \quad x \leq 2 \quad 4x - 2 > 0 \quad x > \frac{1}{2} \quad D_f = (\frac{1}{2}, 2]$$

$$y = \sqrt{4x-a} + \sqrt{b-2x} \longrightarrow b-2x \longrightarrow x \leq \frac{b}{2} \longrightarrow \frac{b}{2} = 2 \longrightarrow b = 4 \quad -\infty$$

$$\hookrightarrow 4x-a \geq 0 \longrightarrow x \geq \frac{a}{4} \longrightarrow \frac{a}{4} \geq 2 \longrightarrow a = 12 \quad \frac{b}{a} = \frac{4}{12} = \frac{1}{3}$$

$$\text{الف)} \quad \text{مشتق} = x^2 - x - 4 = (x-2)(x+2) \quad \Rightarrow \quad \frac{1}{(x-2)(x+2)} \quad -1$$

$$\text{مخرج} = x^2 - 12x^2 + 34 = (x-2)(x+2)(x-3)(x+3)$$

$$x < -3, x > 2 \quad x \neq 3, 2, -2, -3$$

$$(-\infty, -3) \cup (2, 3) \cup (3, +\infty)$$

$$ب) \quad 2x^3 - 2x^2 - 2x + 4 = (x-1)(x-2)(x+2)$$

$$ج) \quad x^3 + 2x^2 - 2x - 4 = (x+1)(x+2)(x-2)$$

$$\frac{(x-1)(x-2)(x+2)}{(x+1)(x+2)(x-2)} \geq 0$$

-2	-1	1	2	3
+	-	+	-	+

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

$$y = \sqrt{[x] - 2} \rightarrow [x] \geq 2 \quad x \geq 2 \quad D_f = [2, +\infty) \quad -9$$

$$ب) \quad \sqrt{2[x] - 8} \quad 2[x] - 8 \geq 0$$

$$[x] \geq \frac{8}{2} \rightarrow x \geq 4 \quad D_f = [4, +\infty)$$

$$الف) \quad \sqrt{\frac{x+1}{|x-3|}} + \sqrt{\frac{4-x}{x^2+2x+2}} \quad x+1 \geq 0 \rightarrow x \geq -1, x \neq 3 \quad -1.$$

$$x^2 + 2x + 2 = (x+1)^2 + 1 > 0$$

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

$$D_f = [-1, 3) \cup (3, 4]$$

$$ب) \quad \sqrt{[x] - 2} + \sqrt{2 - [x]} \rightarrow [x] - 2 \geq 0 \rightarrow [x] \geq 2 \rightarrow x \geq 2$$

$$D_f = \emptyset \quad 2 - [x] \geq 0 \rightarrow [x] \leq 2 \rightarrow [x] \leq 2 \rightarrow x < 3$$

