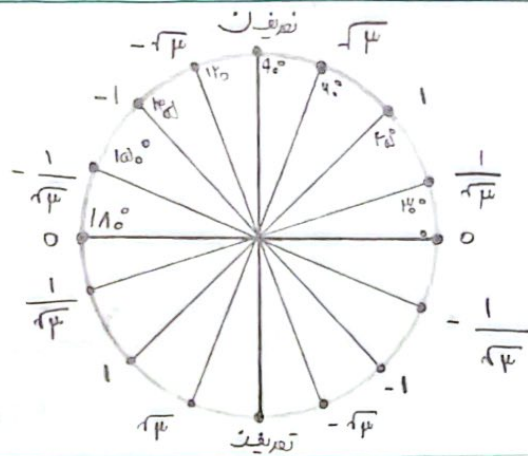




الف) $\frac{1}{\sqrt{3}} + (-1) + (\sqrt{3}) = -\frac{1}{\sqrt{3}} - \frac{\varepsilon}{\sqrt{3}} = -\frac{\omega}{\sqrt{3}}$

ب) $\frac{\sqrt{3}}{\sqrt{3}} + \frac{\sqrt{3}}{\sqrt{3}} - 3(-\frac{\sqrt{3}}{\sqrt{3}}) = \frac{\omega\sqrt{3}}{\sqrt{3}}$

ج) $\frac{-\sqrt{3}}{\sqrt{3}} + 3(\frac{\sqrt{3}}{\sqrt{3}}) - 2(-\frac{\sqrt{3}}{\sqrt{3}}) = \frac{-\sqrt{3}}{\sqrt{3}} + \frac{3\sqrt{3}}{\sqrt{3}} + \frac{2\sqrt{3}}{\sqrt{3}} = \frac{\varepsilon\sqrt{3}}{\sqrt{3}}$

د) $\cos(0) = 1 \quad \cos \frac{\pi}{\sqrt{3}} = \frac{1}{\sqrt{3}}$
 $1 + \sin(\frac{\pi}{\sqrt{3}}) = 1 + 1 = \boxed{2}$

$a^2 + \varepsilon a = 3a + 2$

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

$a^2 + a - 2 = 0$
 $(a+2)(a-1) = 0 \rightarrow \begin{cases} a = -2 \\ a = 1 \end{cases}$

$\hookrightarrow f(1) = \boxed{\omega}$

$| -3 + 1 | \geq 2 \rightarrow | -2 | \geq 2 \rightarrow \checkmark \rightarrow \boxed{-3} \rightarrow$ در دو شرط صادق است

$18 - b = a - 4 \rightarrow a + b = 18 + 4 = \boxed{22}$

الف) $x^2 - \varepsilon x^2 \neq 0 \rightarrow x^2(x-1) \neq 0 \quad x \neq 0 \text{ و } 1$

$D_f = \mathbb{R} - \{0, 1\}$

ب) $(x^2 + \varepsilon x^2) + (3x + 2) \neq 0$

$\underbrace{x^2}_{+} + \underbrace{\varepsilon x^2}_{0} + \underbrace{3x}_{+} + \underbrace{2}_{0} = 0 \quad \begin{matrix} x+2=0 \\ x \neq -2 \end{matrix}$

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

$$x^2 - 1 \geq 0 \quad x \geq -1 \cap x \geq 1 \rightarrow D_f = [1, +\infty)$$

$$\begin{aligned} \text{ب) } 4 - 13x &\geq 0 \quad 13x \leq 4 \quad x \leq \frac{4}{13} \\ 4x - 1 &\geq 0 \quad 4x \geq 1 \quad x \geq \frac{1}{4} \end{aligned} \rightarrow D_f = \left[\frac{1}{4}, \frac{4}{13}\right]$$

$$\begin{aligned} 4x - a &\geq 0 \quad 4x \geq a \quad x \geq \frac{a}{4} \\ b - 13x &\geq 0 \quad 13x \leq b \quad x \leq \frac{b}{13} \end{aligned} \rightarrow D_f = \left[\frac{a}{4}, \frac{b}{13}\right]$$

$$\frac{a}{4} = \frac{b}{13} \rightarrow \frac{b}{a} = \frac{13}{4} = \boxed{\frac{1}{\frac{4}{13}}}$$

$$\text{مثال 1) } x^2 = t \rightarrow t^2 - 13t + 14 \rightarrow x^2 = t \rightarrow x = \pm \sqrt{t} \pm \mu$$

$$(x-4)(x-1) \rightarrow x = 4 \quad x = 1$$

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

$$D_f = (-\infty, -1) \cup (1, 4) \cup (4, +\infty)$$

$$\text{ب) } x^2 - 13x + 4 \geq 0 \quad \frac{x-1}{x^2 - x - 4}$$

$$x^2 + 13x - 4 \geq 0 \quad \frac{x+1}{x^2 + x - 4}$$

$$y = \sqrt{\frac{(x-1)(x-13)(x+1)}{(x+1)(x+13)(x-4)}} \rightarrow -13, -1, 1, 4, 13 \quad D_f = (-\infty, -13) \cup [-1, -1] \cup [1, 4) \cup [13, +\infty)$$

$$\text{الف) } y = \sqrt{f(x) - \varepsilon} \rightarrow f(x) \geq \varepsilon \quad [x] \geq 1 \quad x \geq 1 \quad D_f = [1, +\infty)$$

$$\text{ب) } y = \sqrt{f(x) - \delta} \rightarrow f(x) \geq \delta \quad [x] \geq \frac{\delta}{f} \quad x \geq 13 \quad D_f = [13, +\infty)$$

$$\text{الف) } \sqrt{\frac{x+1}{|x-1|}} \rightarrow D_f = [-1, 1) \cup (1, +\infty)$$

$$\sqrt{\frac{4-x}{x^2 + 13x + 4}} \rightarrow D_f = (-\infty, 4]$$

$$\Delta < 0$$

$$\begin{aligned} \text{ب) } \sqrt{f(x) - \varepsilon} &\rightarrow [x] \geq \varepsilon \quad x \geq \varepsilon \rightarrow D_f = [\varepsilon, +\infty) \\ \sqrt{f(x) - \delta} &\rightarrow [x] \leq 1 \quad x \leq 13 \rightarrow D_f = (-\infty, 13) \end{aligned} \rightarrow D_f = \emptyset$$