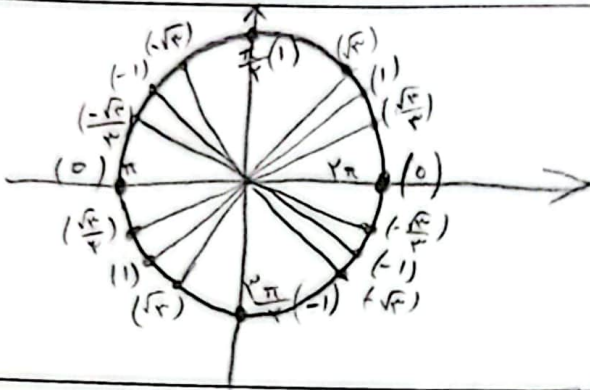




الف) $\frac{1}{2} + (-1) + 2(-\frac{1}{2}) = -\frac{1}{2}$

ب) $\frac{1}{2}(-\frac{\sqrt{3}}{2}) + \frac{\sqrt{3}}{2}(-\frac{1}{2}) = -\frac{\sqrt{3}}{4} = -\frac{\sqrt{3}}{4}$

ج) $\frac{\sqrt{3}}{3} + 2(\frac{\sqrt{3}}{3}) - 2(-\frac{\sqrt{3}}{3}) = \frac{4\sqrt{3}}{3}$

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

چون $n = 9$ در هر دو ضلع برابر است پس باید در a را حساب می‌کنیم:

$n = a \rightarrow a^2 + 4a = 2a + a + 2 \Rightarrow a^2 + a - 2 = 0 \Rightarrow (a+2)(a-1) = 0$

$\begin{cases} a = -2 \\ a = 1 \end{cases} \rightarrow f(1) = (1)^2 + 4(1) = 1 + 4 = 5$

$|n+1| \geq 2 \begin{cases} n+1 \geq 2 \Rightarrow n \geq 1 \\ n+1 \leq -2 \Rightarrow n \leq -3 \end{cases}$

(در هر دو ضلع برابر است)

$(n = -1) \rightarrow 2(-1)^2 - b = a + 2(-1) \Rightarrow 2 - b = a - 2 \Rightarrow a + b = 4$

الف) $2^3 - 4n^2 \neq 0 \Rightarrow n^2(n-4) \neq 0$

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

$\frac{0}{2} - \frac{4}{2} = \frac{4}{2}$

ب) $D_f = \mathbb{R}$

الف) $\begin{cases} x^2 - 1 \geq 0 \Rightarrow x \leq -1 \text{ یا } x \geq 1 \\ x - 2 \geq 0 \Rightarrow x \geq 2 \end{cases} \Rightarrow D_f = (-\infty, -1] \cup [1, +\infty) \text{ (1)}$
 $\Rightarrow D_f = [2, +\infty) \text{ (2)}$ $\xrightarrow{(1) \cap (2)} D_f = [2, +\infty)$

ب) $\begin{cases} 4 - 3x \geq 0 \Rightarrow x \leq \frac{4}{3} \Rightarrow x \leq 2 \\ 6x - 3 \geq 0 \Rightarrow x \geq \frac{1}{2} \end{cases} \Rightarrow D_f = \left(\frac{1}{2}, 2\right]$

چون دامنه برابر $\{2\}$ است یعنی هر عددی غیر از 2 بی نهایت جواب پیدا نمی کند و تنها $x=2$ پیدا می شود پس:

$\begin{cases} f(2) - a = 0 \Rightarrow a = 12 \\ b - 3(2) = 0 \Rightarrow b = 6 \end{cases} \Rightarrow \frac{b}{a} = \frac{6}{12} = \frac{1}{2}$

الف) $\sqrt{\frac{(x-3)(x+2)}{(x-2)(x+1)(x-3)(x+2)}} = \frac{-3 - 2 + 2 + 3}{x^2 - 1} \Rightarrow D = (-\infty, -3) \cup (2, 3) \cup (3, +\infty)$

ب) $\sqrt{\frac{(x-1)(x-3)(x+2)}{(x+1)(x+3)(x-2)}} = \frac{3 - 2 - 1 + 1 + 2 + 3}{x^2 - 1} \Rightarrow D = (-\infty, -3) \cup [3, +\infty) \cup \{-2, 1, 3\}$

الف) $2[x] - 4 \geq 0 \Rightarrow 2[x] \geq 4 \Rightarrow [x] \geq 2 \Rightarrow x \geq 2 \Rightarrow D = [2, +\infty)$

ب) $2[x] - 5 \geq 0 \Rightarrow 2[x] \geq 5 \Rightarrow [x] \geq \frac{5}{2} \Rightarrow [x] \geq 3 \Rightarrow x \geq 3 \Rightarrow D = [3, +\infty)$

الف)

$\begin{cases} \sqrt{\frac{x+1}{x-3}} \rightarrow \begin{cases} x+1 \geq 0 \Rightarrow x \geq -1 \\ x-3 \geq 0 \Rightarrow x \geq 3 \end{cases} \rightarrow [-1, 3) \text{ (1)} \\ \sqrt{\frac{x-3}{x-3}} \rightarrow \begin{cases} x-3 \geq 0 \Rightarrow x \geq 3 \\ x-3 \leq 0 \Rightarrow x \leq 3 \end{cases} \rightarrow \{3\} \text{ (2)} \end{cases}$

$\sqrt{\frac{4-x}{x^2+2x+4}} \Rightarrow 4-x \geq 0 \Rightarrow x \leq 4 \Rightarrow D_f = [-1, 3]$

ب) $\begin{cases} [x] - 4 \geq 0 \Rightarrow [x] \geq 4 \Rightarrow x \geq 4 \Rightarrow [4, +\infty) \\ 2 - [x] \geq 0 \Rightarrow [x] \leq 2 \Rightarrow x \leq 3 \Rightarrow (-\infty, 3) \end{cases} \rightarrow D_f = \emptyset$