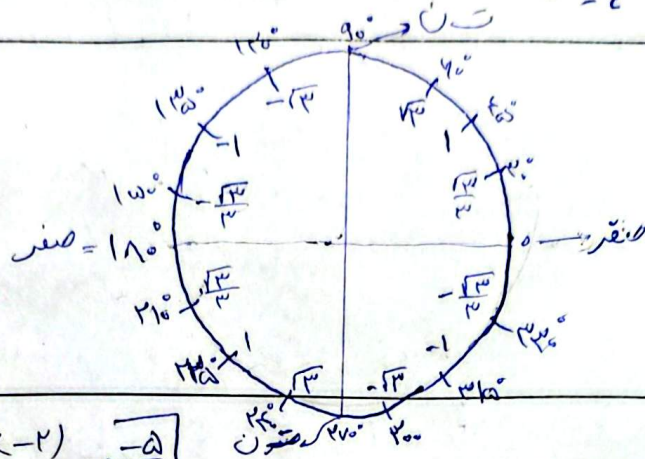




الف) $\frac{1}{2} + (-1) \cdot (-2) \rightarrow \boxed{\frac{-5}{2}}$

ب) $\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} + \frac{3\sqrt{3}}{2} = \boxed{\frac{5\sqrt{3}}{2}}$

ج) $-\frac{\sqrt{3}}{2} + \sqrt{3} + \left(\frac{2}{\sqrt{3}}\right) \rightarrow -\frac{\sqrt{3}}{2} + \frac{2\sqrt{3}}{2} + \frac{2\sqrt{3}}{2} = \boxed{\frac{3\sqrt{3}}{2}}$

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

$a^2 + 5a = 2a + a + 2 \rightarrow a^2 + a - 2 = 0$

$f(1) \rightarrow 1 + 1 = \boxed{2}$

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

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

$\begin{aligned} x+1 \geq 2 &\rightarrow x \geq 1 \\ x+1 \leq -2 &\rightarrow x \leq -3 \end{aligned}$

$f(-3) \rightarrow 1 - b = a - 4 \rightarrow a + b = \boxed{24}$

الف) $x^2(x^2 - 4) = 0 \rightarrow D_f = \mathbb{R} - \{0, 2\}$

ب) $2x^3 + 5x^2 + 2x + 4 \rightarrow x^2(2x+5) + (2x+4) - (2x+5)(\frac{2x+4}{x}) = 0$

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

$x = -2$

$$\text{الف) } x^2 - 1 \geq 0 \rightarrow x^2 \geq 1 \rightarrow x \geq 1, x \leq -1$$

$$x - 2 \geq 0 \rightarrow x \geq 2 \rightarrow \boxed{[2, +\infty)}$$

$$\text{ب) } 9 - 3x \geq 0 \rightarrow 9 \geq 3x \rightarrow 3 \geq x$$

$$4x - 3 > 0 \rightarrow 4x > 3 \rightarrow x > \frac{3}{4} \left\} \rightarrow \boxed{\left(\frac{3}{4}, 3\right]}$$

$$\text{if } x = 2 \Rightarrow$$

$$4x^2 - a = 0 \quad \boxed{a = 16}$$

$$b - 4 = 0 \rightarrow \boxed{b = 4}$$

$$\frac{b}{a} = \frac{4}{16} = \frac{1}{4} \in \left(\frac{1}{4}, 1\right)$$

$$\text{الف) } y = \sqrt{\frac{(x-3)(x+2)}{x^2 - 13x + 34}} \rightarrow \begin{matrix} \text{num} & \text{den} \\ x^2 - 13x + 34 & \end{matrix} \xrightarrow{x^2 +} t^2 - 13t + 34 \rightarrow (t-4)(t-9) = 0$$

$$\begin{matrix} -3 & -2 & 4 & 9 \\ + & - & + & - \end{matrix} \rightarrow D_f = (-\infty, -3) \cup (2, 4) \cup (9, +\infty)$$

$$\text{ب) } \sqrt{\frac{(n-1)(n^2-n-4)}{(n+1)(n^2+n-4)}} \rightarrow \begin{matrix} \text{num} & \text{den} \\ (n-1)(n^2-n-4) & (n+1)(n^2+n-4) \end{matrix} \rightarrow \begin{matrix} -1 & -4 & 4 & 9 \\ + & - & + & - \end{matrix}$$

$$D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [9, +\infty)$$

$$\text{الف) } 2[n] - 4 \geq 0 \rightarrow [n] \geq 2 \rightarrow \boxed{x \geq 2}$$

$$\text{ب) } 2[n] - 6 \geq 0 \rightarrow [n] \geq 3 \rightarrow \boxed{x \geq 3}$$

$$\text{الف) } \sqrt{\frac{x+1}{x-3}} + \sqrt{\frac{4-x}{(x+2)^2}} \rightarrow \begin{matrix} -1 & 3 \\ + & - \end{matrix} \quad \begin{matrix} -2 & 4 \\ + & - \end{matrix}$$

$$\boxed{[-1, 2] - \{+3\}} \leftarrow [-1, +\infty) \cap (-\infty, 4] - \{-2\}$$

$$\text{ب) } [n] - 4 \geq 0 \rightarrow [n] \geq 4 \rightarrow x \geq 4$$

$$2 - [n] \geq 0 \rightarrow [n] \leq 2 \rightarrow x \leq 3 \left\} \rightarrow \emptyset$$