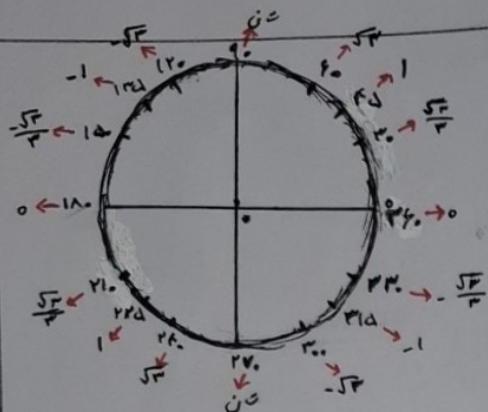




الف) $\frac{1}{4} + (-1) + 2\pi(-1) = -\frac{3}{4}$

ب) $-(-\frac{\sqrt{3}}{4}) + \frac{\sqrt{3}}{4} - 3(-\frac{\sqrt{3}}{4}) = \frac{5\sqrt{3}}{4}$

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

د) $\cos(0) + \sin(\frac{\pi}{4}) = 1 + 1 = 2$

$a^2 + a = 2a + 2 \Rightarrow a^2 + a - 2 = 0 \Rightarrow (a+2)(a-1) = 0 \Rightarrow a = -2 \text{ or } a = 1$

$|x+1| \geq 2 \Rightarrow \begin{cases} x \geq 1 \\ x \leq -3 \end{cases}$
 $f(x) = \begin{cases} 2x^2 - b & x \geq 1 \\ a + 2x & -3 \leq x \leq -1 \end{cases} \Rightarrow 18 - b = a - 2 \Rightarrow a + b = 20$

الف) $\frac{1}{x^3 - 4x^2} \Rightarrow x^2(x-4) \quad D_f = \mathbb{R} - \{0, 4\}$

ب) $\frac{1}{x^3 + 4x^2 + 2x + 8} \Rightarrow 2(x^2 + 4x^2 + 2x + 8) \Rightarrow 2(x^2(x+4) + 2x + 8) \Rightarrow 2(x^2(x+4) + 2(x+4)) \Rightarrow 2(x+4)(x^2 + 2) \Rightarrow x+4 = 0 \Rightarrow x = -4$
 $D_f = \mathbb{R} - \{-4\}$

الف) $\sqrt{(x-1)(x+1)} + \sqrt{x-2} \Rightarrow$ ① $\frac{-1}{+} \frac{1}{-} \frac{1}{+}$
 $(-\infty, -1] \cup [1, +\infty)$

② $x \geq 2$

③ $\cup \mathbb{Q} = [2, +\infty)$

ب) $\sqrt{\frac{x(x-1)}{x(x-1)}} \Rightarrow \frac{1}{-} \frac{1}{+} \frac{1}{-}$ $(\frac{1}{2}, 2]$

$\left. \begin{array}{l} x-a \geq 0 \rightarrow x \geq \frac{a}{b} \\ b-x \geq 0 \rightarrow x \leq \frac{b}{a} \end{array} \right\} \Rightarrow \frac{b}{a} = \frac{a}{b} \Rightarrow \frac{b}{a} = \frac{a}{b} = \frac{1}{\frac{1}{a}} = \frac{1}{b}$

الف) $\sqrt{\frac{(x-3)(x+3)}{x^2-1}}$ $\frac{-3}{+} \frac{-1}{-} \frac{1}{-} \frac{1}{+}$ $(-\infty, -3) \cup (3, +\infty) - \{3\}$
 $(x-3)(x+3)$
 x^2-1
 $t=x^2$ $9=x^2 \Rightarrow x=\pm 3$
 $1=x^2 \Rightarrow x=\pm 1$

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

الف) $\sqrt{x-2} \geq 0 \Rightarrow [x] \geq 2 \rightarrow x \geq 2 \rightarrow [2, +\infty)$

ب) $\sqrt{x-4} \geq 0 \Rightarrow [x] \geq \frac{4}{1} \rightarrow [x] \geq 4 \rightarrow x \geq 4 \rightarrow [4, +\infty)$

الف) $\sqrt{\frac{x+1}{x-1}} + \sqrt{\frac{x-1}{x+1}} \Rightarrow x \leq 1$
 $x \geq -1$
 $x \neq 1$
 $\Rightarrow [-1, 1] - \{1\}$

ب) $[x] \geq 1, [x] \leq 2 \Rightarrow x \geq 1, x < 3 \Rightarrow (-\infty, 3) \cup [1, +\infty) = \emptyset$