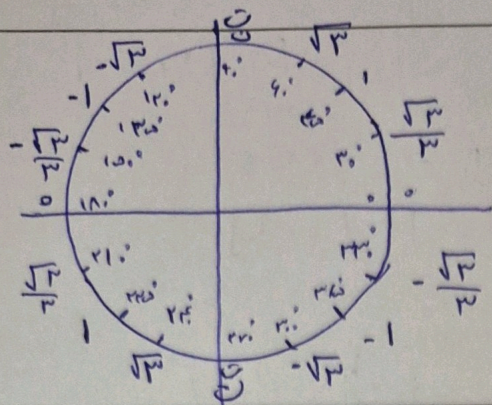




الف) $\frac{1}{2} + (-1) + 2 \times (-1) = -\frac{3}{2} + \frac{1}{2} = -1$

ب) $\frac{\sqrt{3}}{2} + \frac{\sqrt{3}}{2} - 2 \left(-\frac{\sqrt{3}}{2}\right) = \frac{3\sqrt{3}}{2}$

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

د) $1 + 1 = 2$

$a^2 + 2a = 2a + a + 1 \rightarrow a^2 + a - 2 = 0 \quad (a+2)(a-1) = 0 \quad a_2 = -2 \quad \boxed{a = 1}$

$$\left. \begin{array}{l} x \geq 1 \rightarrow x^2 + 2x \\ x \leq 1 \rightarrow x^2 + 2 \end{array} \right\} f(1) = 2 + 2 = 4$$

$$\left. \begin{array}{l} x+1 \geq 2 \rightarrow x \geq 1 \\ x+1 \leq -2 \rightarrow x \leq -3 \\ -3 \leq x \leq -1 \rightarrow a+2x \end{array} \right\} \begin{array}{l} x^2 - b \\ \boxed{x = -3} \end{array}$$

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

الف) $x^2(x-4) \neq 0 \quad D: \mathbb{R} - \{0, 4\}$

ب) $2x^2 + 4x^2 + 2x + 4 \neq 0$

$x \neq -2$

$D: \mathbb{R} - \{-2\}$

$x^2(2x+4) + 2x+4 = (2x+4)(x^2+1) \neq 0$

الف) $x^2 - 1 \geq 0$ $x^2 \geq 1 \rightarrow \frac{-1}{+} - \frac{1}{-} +$ } انزياح $\Rightarrow \boxed{x \geq 2}$
 $x - 2 \geq 0$ $\boxed{x \geq 2}$ $D: [2, +\infty)$

ب) $4 - 3x \geq 0$ $x \leq \frac{4}{3}$ } انزياح $\rightarrow \frac{1}{4} \leq x \leq 2$
 $4x - 2 \geq 0$ $x \geq \frac{1}{2}$ $D: [\frac{1}{2}, 2]$

$4x - a \geq 0$ $x \geq \frac{a}{4}$ } $\frac{a}{4} = \frac{b}{3} = 2 \Rightarrow \frac{b}{a} = \frac{1}{2}$
 $b - 3x \geq 0$ $x \leq \frac{b}{3}$

صورت + مجموع فراب منفر

$x^3 - 2x^2 - 4x + 4$ $\frac{x-1}{x^2 - x - 4}$

مجموع فراب زودتر
برای $\rightarrow$ منفر

$x^3 + 2x^2 - 4x - 4$ $\frac{x+1}{x^2 + x - 4}$

الف) $\frac{(x-3)(x+2)}{(x-2)(x+2)(x-3)(x+3)} \geq 0$ $\frac{-3}{+} - \frac{2}{-} - \frac{2}{+} + \frac{3}{+}$

$x^2 - 13x + 30 = (x-4)(x-9) \geq 0$ $\begin{matrix} x^2 \geq 4 & x_2 \geq 2 \\ x^2 \geq 9 & x_2 \geq 3 \end{matrix}$ $\Rightarrow D: (-\infty, 2) \cup (2, 3) \cup (3, +\infty)$

ب) $\frac{(x-1)(x-3)(x+2)}{(x+3)(x-1)(x+1)} \geq 0$ $\frac{-3}{+} - \frac{2}{-} - \frac{1}{+} + \frac{1}{-} + \frac{2}{+} - \frac{3}{+}$ $D: (-\infty, 2) \cup [2, 1) \cup [1, 2) \cup [3, +\infty)$

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

ب) $2[x] - a \geq 0$ $[x] \geq \frac{a}{2}$ $x \geq 3$ $D: [3, +\infty)$

الف) $\frac{x+1}{|x-3|} \geq 0$ $x \geq -1$ $\frac{4-x}{(x+2)^2} \geq 0$ $4-x \geq 0$ $\boxed{x \leq 4}$
 $\boxed{x \neq 3}$ $D: [-1, 4] - \{3, -2\}$

ب) $[x] \geq 4$ $\boxed{x \geq 4}$ } انزياح $= \emptyset$
 $2 - [x] \geq 0$ $[x] \leq 2$ $\boxed{x < 3}$ $D: \emptyset$