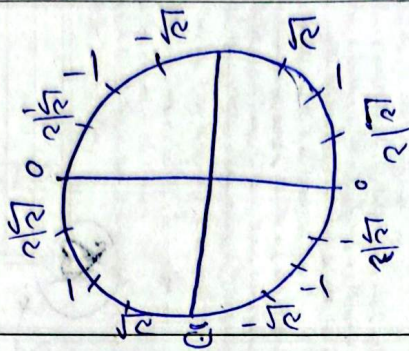




۱

الف) $\frac{1}{r} + (-1) + 2(-1) = \frac{-5}{r}$

ب) $\frac{1}{r} + \frac{\sqrt{2}}{r} + \frac{\sqrt{2}}{r} = \frac{2\sqrt{2}}{r}$

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

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

۲

$x=a \rightarrow a^2 + \varepsilon a = 3a + 2 \rightarrow a^2 + a - 2 = 0 \rightarrow (a+2)(a-1) = 0$

$a = -2 \rightarrow \text{مردود}$

$a = 1 \rightarrow \checkmark \rightarrow f(1) = 1 + \varepsilon = 5$

۳

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

$\rightarrow \frac{2 \times (-3)^2}{11} - b = a - 6 \rightarrow a + b = 2\varepsilon$

۴

$y = \frac{1}{x^2 - \varepsilon x^2} \rightarrow y = \frac{1}{x^2(x - \varepsilon)} \rightarrow x \neq \varepsilon, 0 \rightarrow D_f = \mathbb{R} - \{0, \varepsilon\}$

۵

$y = \frac{1}{2x^2 + \varepsilon x^2 + 2x + \varepsilon} \xrightarrow{\text{مخرج}} \frac{2 + \varepsilon = 2 + \varepsilon}{x^2 + 2} \rightarrow x + 2 = \frac{2 + \varepsilon}{x^2 + 2}$

$\hookrightarrow 2x^2(x+2) + 2(x+2) = (x+2)(2x^2 + 2) = 2(x+2)(x^2 + 1)$

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

$$\text{الف) } \left\{ \begin{array}{l} x^2 - 1 \geq 0 \rightarrow \begin{cases} x \geq 1 \\ x \leq -1 \end{cases} \\ x - 2 \geq 0 \rightarrow x \geq 2 \end{array} \right\} \xrightarrow{\cap} x \geq 2 \rightarrow D_f = [2, +\infty)$$

$$\text{ب) } \left\{ \begin{array}{l} 9 - 2x \geq 0 \rightarrow 2 \geq x \\ 4x - 1 \geq 0 \rightarrow x \geq \frac{1}{4} \end{array} \right\} \xrightarrow{\cap} D_f = \left(\frac{1}{4}, 2 \right]$$

$$y = \sqrt{ax - a} + \sqrt{b - 2x} \rightarrow D_f = \{2\}$$

$$x=2 \rightarrow 0 = \sqrt{12 - a} + \sqrt{b - 4}$$

$$\begin{array}{ccc} \downarrow = 0 & & \downarrow = 0 \\ a = 12 & & b = 4 \end{array} \Rightarrow \frac{b}{a} = \frac{1}{3}$$

$$\text{الف) } \sqrt{\frac{x^2 - x - 6}{x^2 - 12x + 36}} = \sqrt{\frac{(x-3)(x+2)}{(x-6)^2}} \Rightarrow \frac{-}{+} \frac{+}{-} \frac{-}{+} \frac{+}{+} \Rightarrow D_f = (-\infty, -2) \cup (2, 6) \cup (6, +\infty)$$

$$\text{ب) } \sqrt{\frac{x^2 - 2x^2 - 8x + 6}{x^2 + 2x^2 - 8x - 6}} = \sqrt{\frac{(x-1)(x^2 - x - 6)}{(x+1)(x^2 + x - 6)}} = \sqrt{\frac{(x-1)(x-3)(x+2)}{(x+1)(x-2)(x+3)}} \Rightarrow \frac{-}{+} \frac{+}{-} \frac{-}{+} \frac{+}{-} \frac{+}{+} \Rightarrow D_f = (-\infty, -3) \cup [-2, -1) \cup [1, 2) \cup [3, +\infty)$$

$$\text{الف) } y = \sqrt{2[x] - 8} \rightarrow 2[x] \geq 8 \rightarrow [x] \geq 4 \rightarrow x \geq 4 \rightarrow D = [4, +\infty)$$

$$\text{ب) } y = \sqrt{2[x] - 8} \rightarrow 2[x] \geq 8 \rightarrow [x] \geq 4 \rightarrow x \geq 4 \rightarrow D = [4, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{x+1}{|x-1|}} + \sqrt{\frac{9-x}{x^2+2x+1}} \rightarrow \left\{ \begin{array}{l} x \neq 1 \\ x \geq -1 \\ x \leq 9 \\ \Delta < 0 \rightarrow \text{بطل محذور} \end{array} \right\} \Rightarrow D_f = [-1, 9] - \{1\}$$

$$\text{ب) } \sqrt{[x] - 8} + \sqrt{2 - [x]} \Rightarrow D_f = \emptyset \leftarrow \text{بطل جواب}$$

