

الف) $\frac{x^3 + 2x^2 - 11x + 3}{x^3 + 2x^2}$ $\frac{x-1}{x^3 + 2x^2 - 3}$ $\frac{1}{x} < \frac{1}{-3}$

ب) $\frac{x^3 + 9x^2 + 10x + 3}{x^3 + 2x^2}$ $\frac{x+1}{x^3 + 2x^2 + 3}$ $\frac{1}{x} < \frac{1}{-3}$

$x^3 + 2x^2 - 11x + 3 = (x-1)(x-\frac{1}{2})(x+3) \Rightarrow D_f = \mathbb{R} - \{-3, -\frac{1}{2}, 1\}$

$x^3 + 9x^2 + 10x + 3 = (x+1)(x+\frac{1}{2})(x+3) \Rightarrow D_f = \mathbb{R} - \{-3, -1, -\frac{1}{2}\}$

الف) $\frac{x^3 - 2x^2 + 2x + 1}{x^3 - 2x^2}$ $\frac{x-1}{x^3 - 2x^2 + 1}$ $\Delta < 0 \Rightarrow$ $\frac{x-1}{x-1}$

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

$D_f = \mathbb{R} - \{1\}$

$D_f = (-\infty, -3] \cup (1, +\infty)$

$x > 1$ $\frac{x}{x^3 - 2x^2 + 1} = \frac{x}{(x-1)(x-2)}$

$x = 1$ $\frac{x}{x}$

$x < 1$ $\frac{x}{x^3 + 2x} = \frac{x}{x(x+2)}$

$D_f = \mathbb{R} - \{-2, 0, 1, 2\}$

الف) $[-x] - 2 \geq 0$ $[-x] \geq 2$ $x \leq -2 \Rightarrow (-\infty, -2] = D_f$

ب) $\frac{x^2 + 2}{(x^2 - 3)(x^2 + 1)}$ $\Rightarrow [x] = -1 \rightarrow -1 \leq x < 0$ $[x] = 2 \rightarrow 2 \leq x < 3$

$D_f = \mathbb{R} - [-1, 0) \cup [2, 3)$

الف) $[x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 0 \Rightarrow 1 \Rightarrow 2[x + \frac{1}{x}] \geq 1 \rightarrow [x + \frac{1}{x}] \geq \frac{1}{2} \Rightarrow [x + \frac{1}{x}] \geq 1 \Rightarrow x + \frac{1}{x} \geq 1 \Rightarrow x \geq \frac{1}{x}$

$D_f = [\frac{1}{x}, +\infty)$

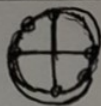
ب) $[x - \frac{1}{x}] + [\frac{1}{x} - x] \geq 0 \Rightarrow$

$x - \frac{1}{x} \in \mathbb{Z}$ $x \in \mathbb{Z} + \frac{1}{x}$

$D_f = \{x | x = k + \frac{1}{x}, k \in \mathbb{Z}\}$

$$\text{الف) } \tan x \neq -1 \Rightarrow D_f = \mathbb{R} - \left\{ K\pi + \frac{3\pi}{4}, \frac{K\pi}{4} \right\}$$

$$\cot x \Rightarrow \begin{matrix} \text{باید تعریف} \\ \text{شده باشد} \end{matrix} \quad \tan x \Rightarrow \begin{matrix} \text{باید تعریف} \\ \text{شده باشد} \end{matrix}$$



$$\text{ب) } 1 - (\sin x)^2 \geq 0 \Rightarrow \sin^2 x \leq \frac{1}{4} \Rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$$

$$D_f = \left[K\pi - \frac{\pi}{6}, K\pi + \frac{\pi}{6} \right]$$



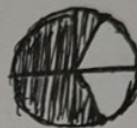
$$\text{الف) } 2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2}$$

$$D_f = \left[2K\pi + \frac{\pi}{6}, 2K\pi + \frac{5\pi}{6} \right]$$



$$\text{ب) } 1 - 2 \cos x \geq 0 \Rightarrow \cos x \leq \frac{1}{2}$$

$$D_f = \left[2K\pi + \frac{\pi}{3}, 2K\pi - \frac{\pi}{3} \right]$$



$$\text{الف) } -1 \leq x^2 + 2x + 1 \leq 1 \rightarrow \begin{cases} x^2 + 2x \leq 0 \rightarrow x(x+2) \leq 0 \text{ ①} \rightarrow \frac{-2}{+} \frac{0}{-} \frac{0}{+} \frac{+}{+} \\ x^2 + 2x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0 \text{ ②} \rightarrow \frac{-2}{+} \frac{-1}{-} \frac{0}{+} \frac{+}{+} \end{cases} \Rightarrow [-2, -1] \cup [-1, 0]$$

$$\text{ب) } -1 \leq \sqrt{2-x} \leq 1 \rightarrow \begin{cases} 2-x \leq 1 \Rightarrow x \geq 1 \text{ ①} \\ 2-x \geq 0 \Rightarrow x \leq \frac{2}{1} \text{ ②} \end{cases} \Rightarrow 1 \leq x \leq \frac{2}{1} \Rightarrow \left[1, \frac{2}{1} \right]$$

$$\text{الف) } 1 - \log x > 0 \Rightarrow \log x < 1 \rightarrow x < 10 \quad x > 0 \Rightarrow 0 < x < 10 \Rightarrow (0, 10)$$

$$\text{ب) } 1 - \log \frac{x}{4} > 0 \Rightarrow \log \frac{x}{4} < 1 \rightarrow x > \frac{1}{4} \quad x > 0 \Rightarrow \left(\frac{1}{4}, +\infty \right)$$

$$\text{الف) } x^2 - 1 \geq 0 \Rightarrow x^2 - 1 \geq 1 \Rightarrow x^2 - 2 \geq 0 \Rightarrow x^2 - 2x + 2 \leq 0 \Rightarrow (x-1)(x-2) \leq 0$$

$$\frac{1}{+} \frac{2}{-} \frac{2}{+} \frac{1}{+} \Rightarrow D_f = [1, 2]$$

$$\text{ب) } \frac{x+2}{x+1} \in W \Rightarrow x \in \frac{2W-2}{2W-1} \rightarrow \left\{ x \mid x = \frac{-2K+2}{2K-1}, K \in W \right\}$$