

الف) $2x^3 + 3x^2 - 11x + 3 \neq 0$ $\rightarrow$ $\frac{2x^3 + 3x^2 - 11x + 3}{-(2x^3 - 2x^2)} \cdot \frac{x-1}{x^2 + dx + 3} \rightarrow (x-1)(2x^2 + dx + 3) \neq 0$ سوال 1

$\Delta = 1^2 - 4(2)(3) = -23 < 0$ $\rightarrow$ $\frac{-1 \pm \sqrt{1 - 23}}{4} = \frac{-1 \pm \sqrt{-22}}{4}$

$D_f = \mathbb{R} - \{1, -3, \frac{1}{2}\}$

ب) $2x^3 + 9x^2 + 10x + 3 \neq 0$ $\rightarrow$ $\frac{2x^3 + 9x^2 + 10x + 3}{-(2x^3 + 2x^2)} \cdot \frac{x+1}{x^2 + dx + 3} \rightarrow (x+1)(2x^2 + dx + 3) \neq 0$

$\Delta = 1^2 - 4(2)(3) = -23 < 0$ $\rightarrow$ $\frac{-1 \pm \sqrt{1 - 23}}{4} = \frac{-1 \pm \sqrt{-22}}{4}$

$D_f = \mathbb{R} - \{-1, -3, -\frac{1}{2}\}$

الف) $x^3 - 2x^2 + 2x - 1 \neq 0$ $\rightarrow$ $\frac{x^3 - 2x^2 + 2x - 1}{-(x^3 - x^2)} \cdot \frac{x-1}{x^2 - x + 1} \rightarrow (x-1)(x^2 - x + 1) \neq 0$ سوال 2

$\Delta = 1^2 - 4(1)(1) = -3 < 0$ $\rightarrow$ $\frac{1 \pm \sqrt{1 - 4}}{2} = \frac{1 \pm \sqrt{-3}}{2}$

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

ب) $x^3 - 2x^2 + 2x - 1 \neq 0$ $\rightarrow$ $\frac{x^3 - 2x^2 + 2x - 1}{(x-1)(x^2 - x + 1)} \cdot \frac{-3}{x^2 - x + 1} \rightarrow \frac{-3}{x^2 - x + 1} \neq 0$

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

① $x-1 \geq 0 \rightarrow x \geq 1$ $\rightarrow$ $x^2 - dx + d - 2x + d \neq 0$ سوال 3

$x^2 - 7x + 10 \neq 0$ $\rightarrow$ $(x-2)(x-5) \neq 0$

② $x-1 < 0 \rightarrow x < 1$ $\rightarrow$ $x^2 + dx - d - 2x + d \neq 0$

$x^2 + 3x \neq 0$ $\rightarrow$ $x(x+3) \neq 0$

$\textcircled{1}, \textcircled{2} \rightarrow D_f = \mathbb{R} - \{2, 5, 0, -3\}$

الف) $[-x] \geq 2 \rightarrow -x \geq 2 \rightarrow x \leq -2$ $D_f = (-\infty, -2]$ سوال 4

ب) $[x]^2 - 2[x] - 3 \neq 0$ $\rightarrow$ $[x] \neq -1 \rightarrow x \notin [-1, 0)$

$1-3 = -2$ $\rightarrow$ $[x] \neq 3 \rightarrow x \notin [3, 4)$

$D_f = \mathbb{R} - [-1, 0) - [3, 4)$

الف) $[x - \frac{1}{x}] + [x + \frac{1}{x}] \geq 1 \rightarrow 2[x + \frac{1}{x}] \geq 1 \rightarrow [x + \frac{1}{x}] \geq \frac{1}{2}$ سوال 5

$x + \frac{1}{x} \geq 1 \rightarrow x \geq \frac{1}{x} \rightarrow x^2 \geq 1 \rightarrow x \geq 1$

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

ب) $\frac{[x - \frac{1}{x}]}{a} + \frac{[x + \frac{1}{x}]}{-a} \geq 0$ $\rightarrow$ $\begin{cases} a \in \mathbb{Z} \rightarrow 0 \\ a \notin \mathbb{Z} \rightarrow -1 \end{cases}$

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

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

الف) $\cos x \neq 0$ $\tan x \neq 0$ $\tan x + 1 \neq 0$ $D_f = \mathbb{R} - \left\{ \frac{k\pi}{4}, k\pi - \frac{\pi}{4} \right\}$ (2 د.ب)

$\sin x \neq 0$ $\tan x \neq 0$ $\tan x \neq -1$

ب) $1 - \sqrt{\sin x} \geq 0 \rightarrow \sin x \leq \frac{1}{4}$ $-\frac{1}{4} \leq \sin x \leq \frac{1}{4}$ $D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$

الف) $2\sin x - 1 \geq 0$ $\sin x \geq \frac{1}{2}$ $D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$ (2 د.ب)

ب) $1 - 2\cos x \geq 0$ $\cos x \leq \frac{1}{2}$ $D_f = \left[2k\pi + \frac{\pi}{3}, 2k\pi - \frac{\pi}{3} \right]$

الف) $\frac{-1 \leq x^2 + 2x + 1 \leq 1}{\text{①}}$ $\text{② } x^2 + 2x + 1 \geq 0 \rightarrow \begin{matrix} -1 \\ -2 \end{matrix}$ $\text{③ } x^2 + 2x \leq 0$ (1 د.ب)

$\frac{-2}{+1} \quad \frac{-1}{-1} \quad +$ $\text{①} \cap \text{③} :$

$D_f = [-2, -1] \cup [-1, 0]$

ب) $-1 \leq \sqrt{2-x} \leq 1$ $2-x \leq 1 \rightarrow x \geq 1$ $D_f = [1, +\infty)$

الف) $\text{① } x > 0$ $\text{② } 1 - \log_{\frac{x}{4}} > 0$ $\log_{\frac{x}{4}} < 1$ $x < 4$ (1 د.ب)

$\text{①} \cap \text{②} \Rightarrow D_f = (0, 4)$

ب) $\text{① } x > 0$ $\text{② } 1 - \log_{\frac{1}{4}} > 0 \rightarrow \log_{\frac{1}{4}} < 1$ $x < \frac{1}{4}$

$\text{①} \cap \text{②} \Rightarrow D_f = (0, \frac{1}{4})$

الف) $4^{x-x^2} \geq 4^{x^2}$ $x-x^2 \geq x^2 \rightarrow x^2 - 2x + x^2 \leq 0$ $\frac{1}{+1} \quad \frac{x}{-1} \quad +$ (1 د.ب)

$(x-x^2 \geq \log_{\frac{1}{4}} = x^2 \text{ جاذب، !})$ $a+b+c=0 \rightarrow \begin{matrix} 1 \\ -2 \end{matrix}$ $D_f = [1, 2]$

ب) $\frac{x_n + d}{x_n + k} \in \mathbb{W}$ $x = -\frac{kW - d}{kW - k}$ $D_f = \left\{ x \mid x = \frac{d - kW}{kW - k}, k \in \mathbb{W} \right\}$