

(الف) $\cos n + 1 \neq 0 \Rightarrow \cos n \neq -1 \Rightarrow \cos n \neq -\frac{1}{1} \Rightarrow$

$n \neq \frac{\pi}{2} \text{ و } \frac{3\pi}{2} \Rightarrow D_f = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{2}, 2k\pi + \frac{3\pi}{2} \right\}$

(ب) $\cos n - 1 \neq 0 \Rightarrow \cos n \neq 1 \Rightarrow n \neq 2\pi \Rightarrow$

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

(الف) $\tan n + 1 \neq 0 \Rightarrow \tan n \neq -1 \Rightarrow n \neq \frac{3\pi}{4} \text{ و } \frac{5\pi}{4}$

$\Rightarrow D_f = \mathbb{R} - \left\{ 2k\pi + \frac{3\pi}{4}, 2k\pi + \frac{5\pi}{4} \right\}$

(ب) $\cot n - 1 \neq 0 \Rightarrow \cot n \neq 1 \Rightarrow n \neq \frac{\pi}{4} \text{ و } \frac{5\pi}{4} \Rightarrow$

$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4} \right\}$

(الف) $-1 \leq n^2 - 2 \leq 1 \Rightarrow 1 \leq n^2 \leq 3 \Rightarrow 1 \leq |n| \leq \sqrt{3} \Rightarrow$

$D_f = [\sqrt{3}, -1] \cup [1, \sqrt{3}]$

(ب) $-1 \leq \sqrt{n} - 2 \leq 1 \Rightarrow 2 \leq \sqrt{n} \leq 4 \Rightarrow 4 \leq |n| \leq 16 \Rightarrow$

$D_f = [-16, -4] \cup [4, 16]$

(الف) $-1 \leq |n| - 2 \leq 1 \Rightarrow 2 \leq |n| \leq 4 \Rightarrow D_f = [-4, -2] \cup [2, 4]$

(ب) $-1 \leq n^2 + 3n + 1 \leq 1 \Rightarrow \begin{cases} n^2 + 3n + 1 \leq 1 \Rightarrow n^2 + 3n \leq 0 \Rightarrow n(n+3) \leq 0 \Rightarrow I \\ n^2 + 3n + 1 \geq -1 \Rightarrow n^2 + 3n + 2 \geq 0 \Rightarrow (n+1)(n+2) \geq 0 \Rightarrow II \end{cases}$

$I \cap II \Rightarrow D_f = [-1, 0] \cup [-2, -1]$

(الف) $n^2 - 4 > 0 \Rightarrow n^2 > 4 \Rightarrow |n| > 2 \Rightarrow D_f = (-\infty, -2) \cup (2, +\infty)$

(ب) $2 - |n| > 0 \Rightarrow 2 > |n| \Rightarrow D_f = (-2, 2)$

$$\begin{aligned} \delta - n > 0 &\Rightarrow \delta > n \Rightarrow (-\infty, \delta) \text{ I (الف)} \\ n - \gamma \neq 1 &\Rightarrow n \neq \gamma \text{ II} \\ n - \gamma > 0 &\Rightarrow n > \gamma \Rightarrow (\gamma, +\infty) \text{ III} \\ I \cap II \cap III &= D_f = (\gamma, \delta) \cup (\delta, +\infty) \\ I \cap II \cap III &\Rightarrow D_f = (-\gamma, +\infty) - \{1\} \end{aligned}$$

$$\frac{n(n-1)(n-\gamma)}{n-\gamma} > 0 \Rightarrow n-1 > 0 \Rightarrow n > 1 \Rightarrow (1, +\infty) \text{ I}$$

$$n - \gamma = 0 \Rightarrow n = \gamma \text{ II} \quad I \cap II \Rightarrow D_f = (1, +\infty) - \{\gamma\}$$

$$\begin{aligned} n - \gamma \neq 0 &\Rightarrow n \neq \gamma \text{ I} \quad n + \delta \neq 1 \Rightarrow n \neq -\delta \text{ II} \quad \frac{n+\gamma}{n+\gamma} > 0 \Rightarrow \frac{-\gamma}{+\gamma-\delta} > 0 \\ &\Rightarrow (\gamma, +\infty) \cup (-\infty, -\delta] \text{ III} \quad n + \delta > 0 \Rightarrow n > -\delta \Rightarrow (-\delta, +\infty) \text{ III} \Rightarrow \end{aligned}$$

$$I \cap II \cap III \cap III \cap III \Rightarrow D_f = (-\delta, -\gamma] \cup [\gamma, +\infty) - \{\gamma, -\delta\}$$

$$n - \gamma > 0 \Rightarrow n > \gamma \Rightarrow (\gamma, +\infty) \text{ I} \quad \gamma - 1 \cdot g \frac{(n-\gamma)}{\gamma} > 0 \Rightarrow$$

$$\gamma > 1 \cdot g \frac{(n-\gamma)}{\gamma} \text{ II} \Rightarrow I \cap II \Rightarrow D_f = (\gamma, \gamma]$$

$$\gamma \log \frac{n-\gamma}{\gamma} > 0 \Rightarrow \gamma \log \frac{n}{\gamma} > 1 \Rightarrow \log \frac{n}{\gamma} > \frac{1}{\gamma} \Rightarrow n > \sqrt{\gamma} \text{ I (ب)}$$

$$n > 0 \text{ II} \Rightarrow I \cap II \Rightarrow D_f = (\sqrt{\gamma}, +\infty)$$

$$f^n + 1 \neq 0 \Rightarrow f^n \neq -1 \Rightarrow D_f = \mathbb{R} \text{ (الف)}$$

$$f^n - 1 \neq 0 \Rightarrow f^n \neq 1 \Rightarrow n \neq \log \frac{1}{f} \Rightarrow D_f = \mathbb{R} - \{\log \frac{1}{f}\} \text{ (ب)}$$

$$f^n - \gamma \neq 0 \Rightarrow f^n \neq \gamma \Rightarrow n \neq \log \gamma \Rightarrow D_f = \mathbb{R} - \{\log \gamma\} \text{ (ج)}$$

$$f^n - \gamma \neq 0 \Rightarrow f^n \neq \gamma \Rightarrow n \neq \log \gamma \Rightarrow D_f = \mathbb{R} - \{\log \gamma\} \text{ (د)}$$

$$f(n+1) \in W \Rightarrow f(n) \in W - 1 \Rightarrow n \in \frac{W-1}{f} \Rightarrow D_f = \{n | n = k - \frac{1}{f}, k \in \frac{W}{f}\} \text{ (الف)}$$

$$\frac{f(n-\gamma)}{f(n-\delta)} \in W \quad f(n-\gamma) = \gamma W n - \delta W \Rightarrow \delta W - \gamma = \gamma W n - \gamma \gamma \text{ (ب)}$$

$$\Rightarrow \frac{\gamma W - \gamma}{\delta W - \gamma} \Rightarrow D_f = \{n | n = \frac{\gamma k + 1}{\gamma k - \gamma}, k \in W\}$$