



Q ✓

ii) $x^2 - \Delta x + \epsilon > 0 \rightarrow (x - \frac{\Delta}{2})^2 - \frac{\Delta^2}{4} + \epsilon > 0 \rightarrow \frac{\Delta^2}{4} - \epsilon < (x - \frac{\Delta}{2})^2 \rightarrow \sqrt{\frac{\Delta^2}{4} - \epsilon} < x - \frac{\Delta}{2} < -\sqrt{\frac{\Delta^2}{4} - \epsilon}$

$\rightarrow x^2 - 4x + 4 < 0 \rightarrow (x-1)(x-4) \rightarrow \frac{1}{x-1} \frac{4}{x-4} \rightarrow (1 \quad 4)$

$$2) x^2 + 4x + 4 \geq 0 \rightarrow (x+1)(x+4) \rightarrow \frac{-d}{+d} = \frac{-1}{+4} \rightarrow (-\infty - \Delta] \cup [-1 + \infty)$$

$$1) x^2 - 5x + 4 \leq 0 \rightarrow (x-1)(x-4) \rightarrow \begin{array}{c} 1 \quad 4 \\ x \quad - \quad x \end{array} \rightarrow [1 \quad 4]$$

$$\text{iii) } \frac{x^2 - rx + r}{x - d} < 0 \rightarrow \frac{(x-1)(x-r)}{x-d} \rightarrow \frac{1}{-1} \frac{r}{d} \rightarrow (\infty, 1) \cup (r, d)$$

$$\therefore \frac{x^2-1}{x^2-x+1} \geq 0 \rightarrow \frac{(x+1)(x-1)}{(x-1)(x-1)} \rightarrow \frac{-1}{x-1} \Delta \rightarrow (-\infty, -1] \cup (\Delta, +\infty)$$

Q ✓

ii) $\frac{x^2-1}{x^2-x} \gg 0 \rightarrow \frac{(x-1)(x+1)}{x(x-1)(x+1)} \rightarrow \frac{-1}{-1+1-1} \rightarrow (-1) \in (-\infty, -1)$

$$D_f = (-\infty, -1) \cup (0, +\infty) - \{1\}$$

$$\Rightarrow \frac{x^2-14}{x^2-5x+6} \rightarrow \frac{(x-1)(x+6)}{(x-2)(x-3)} \rightarrow \frac{-1}{x-2} + \frac{1}{x-3} \rightarrow (-\infty, -2] \cup (1, 3) \cup (3, +\infty)$$

$$\text{الف) } \sqrt{f - \sqrt{y - x}} \rightarrow y - x \geq 0 \rightarrow x \leq y \rightarrow y - x \leq f \rightarrow x \geq y - f \rightarrow D_{f, x} = [y - f, y]$$

$$r - \sqrt{r-x} \geq 0 \rightarrow \sqrt{r-x} \leq r \rightarrow r-x \leq r^2 \rightarrow x \geq -1r \rightarrow D_f = [-1r, r]$$

$$-) \sqrt{x-1} \rightarrow x-1 \geq 0 \rightarrow x \geq 1 \rightarrow x-1 \leq 1 \rightarrow x \in [1, 2]$$

$$x - \sqrt{x-1} \geq 0 \rightarrow \sqrt{x-1} \leq x \rightarrow x-1 \leq x^2 \rightarrow x \leq 11$$

ا) $\sqrt{f-x^2} \rightarrow x^2 \leq f \rightarrow x^2 \leq 4 \rightarrow x \leq 2 \rightarrow x \leq \sqrt{4} \rightarrow D_f: (-\infty, 2]$
 $\rightarrow -\sqrt{4} \leq x \leq \sqrt{4}$

$\rightarrow \sqrt{3|x|-9} \rightarrow 3|x|-9 \geq 0 \rightarrow 3|x| \geq 9 \rightarrow |x| \geq 3 \rightarrow D_f: (-\infty, -3] \cup [3, +\infty)$

6

ا) $\sqrt{\frac{|x|+1}{|x|-3}} \rightarrow D_f: \mathbb{R} - \{3, -3\}$

ب) $\sqrt{\frac{\sqrt{x}+1}{\sqrt{x}-3}} \rightarrow D_f: \mathbb{R} - \{9\}$
 $\rightarrow x \geq 0$
 لا ديكال بايد منفرد

1, 6

7

ا) $\frac{\sin x}{x \cos x - 1} \rightarrow x \cos x \neq 0 \rightarrow \cos x \neq \frac{1}{x} \rightarrow D_f: \mathbb{R} - \{k\pi \pm \frac{\pi}{2}\}$

ب) $\frac{\cos x + 1}{x \sin x + 1} \rightarrow x \sin x \neq -1 \rightarrow \sin x \neq -\frac{1}{x} \rightarrow D_f: \mathbb{R} - \{k\pi - \frac{\pi}{2}, k\pi + \frac{\pi}{2}\}$

ج) $\frac{\tan x + 2}{\cot x - 1} \rightarrow \cot x \neq 1 \rightarrow D_f: \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{2}\}$

د) $\frac{\sin x + 1}{x \sin^2 x - 3} \rightarrow x \sin^2 x \neq 3 \rightarrow \sin x \neq \pm \frac{\sqrt{3}}{x} \rightarrow D_f: \mathbb{R} - \{k\pi + \frac{\pi}{6}, k\pi + \frac{5\pi}{6}\}$

8

ا) $\frac{1}{\sqrt{x|x-2|-\frac{1}{x}}} \rightarrow x|x-2| - \frac{1}{x} > 0 \rightarrow x|x-2| > \frac{1}{x} \rightarrow |x-2| > \frac{1}{x^2} \rightarrow x-2 > \frac{1}{x^2}, x-2 < -\frac{1}{x^2}$
 $\rightarrow x-2 > \frac{1}{x^2} \rightarrow x > \frac{1}{x^2}$
 $\rightarrow x < -\frac{1}{x^2} \rightarrow x < -\frac{1}{x^2}$
 $D_f: (-\infty, -\frac{1}{x^2}) \cup (\frac{1}{x^2}, +\infty)$

9

ا) $\sqrt{f-x|x|} \rightarrow f-x|x| \geq 0 \rightarrow x|x| \leq f \rightarrow |x| \leq 2 \rightarrow x \leq 2, x \geq -2$
 $D_f: [-2, 2]$

10

ب) $\sqrt{\frac{|x|}{|x|}} \rightarrow D_f: \mathbb{R} - \{0\}$

2 ✓