

الف) $y = \frac{x+3}{3x^3 - 10x^2 + 11x - 1} =$ $3 - 10 + 11 - 1 = 0$ $(3x^3 - 10x^2 + 11x - 1) \div (x-1) =$ $3x^2 - 7x + 10 \rightarrow x^2 - 7x + 10$ $(x-4)(x-10) \rightarrow x \neq 1, \frac{4}{3}, \frac{10}{3}$ $D = R - \{1, \frac{4}{3}, \frac{10}{3}\}$	ب) $y = \frac{x+3}{3x^3 - x^2 - 11x - 4}$ $3 - 1 = -4 - 1 \Rightarrow 3x^3 - x^2 - 11x - 4 \div (x+1) =$ $3x^2 - 4x - 4 \rightarrow x^2 - 4x - 12$ $\rightarrow (x-4)(x+3) \quad x \neq 4, -1, -\frac{4}{3}$ $D = R - \{-1, -\frac{4}{3}, 4\}$	۲
الف) $y = \frac{x+1}{x - \sqrt{3-2x}}$ جواب غلط ۳ $x - \sqrt{3-2x} \neq 0 \quad x \neq \sqrt{3-2x}$ $x^2 \neq 3-2x \quad x^2 + 2x - 3 \neq 0$ $(x+3)(x-1) \neq 0 \quad x \neq -3, 1$ $D = (-\infty, \frac{3}{2}] - \{1\} \quad x \leq \frac{3}{2}$	ب) $y = \frac{x+2}{x - \sqrt{3x-2}}$ $x - \sqrt{3x-2} \neq 0 \quad x \neq \sqrt{3x-2}$ ✓ $x \neq 1, 2$ $x^2 - 3x + 2 \neq 0 \quad (x-1)(x-2) \neq 0$ $3x-2 \geq 0 \quad 3x \geq 2 \quad x \geq \frac{2}{3}$ $D = [\frac{2}{3}, +\infty) - \{1, 2\}$	۳
الف) $y = \frac{\sin x}{2 \cos x - 1} \quad 2 \cos x \neq 1$ $\cos x \neq \frac{1}{2}$ $D = R - \{2k\pi + \frac{\pi}{3}, 2k\pi - \frac{\pi}{3}\}$	ب) $y = \frac{\cos x + 1}{2 \sin x + 1} \quad 2 \sin x + 1 \neq 0$ $\sin x \neq -\frac{1}{2}$ ✓ $\sin x \neq -\frac{1}{2}$ $D = R - \{2k\pi - \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$	۴
الف) $y = \frac{\tan x + 2}{\cot x - 1} \quad \cot x - 1 \neq 0$ $\cot x \neq 1$ $D = R - \{k\pi, k\pi + \frac{\pi}{4}\}$	ب) $y = \frac{\sin x + 1}{2 \sin^2 x - 3} \quad 2 \sin^2 x - 3 \neq 0$ $\sin^2 x \neq \frac{3}{2}$ ✓ $\sin x \neq \pm \frac{\sqrt{3}}{2}$ $D = R - \{k\pi + \frac{\pi}{6}, k\pi + \frac{5\pi}{6}\}$	۵
الف) $x^2 - 5x + 4 > 0$ + - - + $(x-4)(x-1) > 0$ $D = (-\infty, 1) \cup (4, +\infty)$	ب) $x^2 - 4x + 4 < 0$ + - - + $(x-1)(x-4) < 0$ $D = (1, 4)$	۶
الف) $x^2 + 4x + 4 \geq 0$ + - - + $(x+1)(x+4) \geq 0$ $D = (-\infty, -4] \cup [-1, +\infty)$	ب) $x^2 - 7x + 4 \leq 0$ + - - + $(x-1)(x-4) \leq 0$ $D = [1, 4]$	۷
الف) $\frac{x^2 - 3x + 2}{x - 5} < 0$ + - - + $\frac{(x-1)(x-2)}{x-5} < 0$ $D = (-\infty, 1) \cup (2, 5)$	ب) $\frac{x^2 - 1}{x^2 - 4x + 4} \geq 0$ + - - + $\frac{(x-1)(x+1)}{(x-1)(x-2)} \geq 0$ $D = (-\infty, -1] \cup (2, +\infty)$	۸

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

$(x-1)(x-3) > 0$

$(x-1)(x^2 + x + 1) > 0$

$D = [3, +\infty)$

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

$x^2 \neq 1$ $x \neq \pm 1$

$D = \mathbb{R} - \{-1, +1\}$

الف) $y = \log(x^2 - 3x)$

$x^2 - 3x > 0$ $x(x-3) > 0$

$D = (-\infty, 0) \cup (3, +\infty)$

ب) $y = \log(14 - x^2)$ $14 - x^2 > 0$

$|x| - 2 < 0$ $|x| < 2$ $-2 < x < 2$

$D = (-2, 2) \cup (2, 4) - \{-3, 3\}$

ج) $\log \frac{x^2 - 3x + 1}{x - 2}$ $\frac{(x-3)(x-1)}{x-2} > 0$

$1 - x \neq 0$ $x \neq 1$ $1 - x > 0$ $1 > x$ $x < 1$

$D = (1, +\infty) - \{1\}$

د) $y = \sqrt{x^2 - 11x + 28} + \log x$

$x^2 - 11x + 28 > 0$ $(x-4)(x-7) > 0$ $x < 4$ or $x > 7$

$x > 0$ $x \neq 1$ $x > 0$ $x > 0$

$D = [0, 4] - \{1\}$

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

	-1	0	+1
$x^2 - x$	+	+	-
$x^2 + x$	+	-	+

$y = \sqrt{\frac{x - f(x)}{f(x)}}$ $f(x) \neq 0$ $x - f(x) \geq 0$ $x \geq f(x)$

$x - f(x) > 0$ $x > f(x)$ $x = -1, +3$

$D = (-2, -1] \cup (1, 3]$

