

ا)  $y = \frac{x+2}{3x^2 - 2x + 1}$   $\Rightarrow D_f = \mathbb{R} - \left\{1, \frac{2}{3}, \frac{5}{3}\right\}$

ب)  $y = \frac{x+3}{3x^2 - x^2 - 1x - 2}$   $\Rightarrow D_f = \mathbb{R} - \left\{-1, 2, -\frac{2}{3}\right\}$

ا)  $y = x+1$   $\Rightarrow x \neq \sqrt{2-2x} \Rightarrow x^2 \neq 2-2x$

$\Rightarrow x^2 + 2x - 2 \neq 0 \Rightarrow (x+3)(x-1) \neq 0 \Rightarrow x \neq -3, 1 \Rightarrow x \neq 1$

$2-2x > 0 \Rightarrow 2 > 2x \Rightarrow \frac{2}{2} > x \Rightarrow D_f = (-\infty, 1) \cup (1, \frac{2}{2})$

ب)  $y = \frac{x+2}{x - \sqrt{2x-2}}$   $\Rightarrow x \neq \sqrt{2x-2} \Rightarrow x^2 \neq 2x-2 \Rightarrow x^2 - 2x + 2 \neq 0$

$\Rightarrow (x-1)(x-2) \neq 0 \Rightarrow x \neq 1, 2 \Rightarrow D_f = \left[\frac{2}{2}, 1\right) \cup (1, 2) \cup (2, +\infty)$

ا)  $y = \frac{\sin x}{2(\cos x - 1)}$   $\Rightarrow 2(\cos x - 1) \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow \cos x \neq \frac{1}{2}$

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

ب)  $y = \frac{\cos x + 1}{2\sin x}$   $\Rightarrow 2\sin x \neq 0 \Rightarrow \sin x \neq 0 \Rightarrow D_f = \mathbb{R} - \left\{2k\pi, 2k\pi + \pi\right\}$

ج)  $y = \frac{\tan x}{\cot x - 1}$   $\Rightarrow \cot x \neq 1 \Rightarrow D_f = \mathbb{R} - \left\{k\pi, k\pi + \pi\right\}$

د)  $y = \frac{\sin x + 1}{2\sin^2 x}$   $\Rightarrow 2\sin^2 x \neq 0 \Rightarrow \sin^2 x \neq 0 \Rightarrow \sin x \neq \pm \frac{\sqrt{2}}{2} \Rightarrow D_f = \mathbb{R} - \left\{k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4}\right\}$

ا)  $x^2 - 4x + 4 > 0 \Rightarrow (x-2)(x-2) > 0 \Rightarrow x = (-\infty, 2) \cup (2, +\infty)$

ب)  $x^2 - 4x + 4 < 0 \Rightarrow (x-2)(x-2) < 0 \Rightarrow x = (2, 2)$

ج)  $x^2 + 4x + 4 > 0 \Rightarrow (x+2)(x+2) > 0 \Rightarrow x = (-\infty, -2) \cup (-2, +\infty)$

د)  $x^2 - 4x + 4 \leq 0 \Rightarrow (x-2)(x-2) \leq 0 \Rightarrow x = [2, 2]$

ا)  $x^2 - 3x + 2 < 0 \Rightarrow (x-1)(x-2) < 0 \Rightarrow x = (1, 2)$

ب)  $\frac{x^2 - 1}{x^2 - 4x + 4} \geq 0 \Rightarrow \frac{(x-1)(x+1)}{(x-2)^2} \geq 0 \Rightarrow x = (-\infty, -1] \cup (1, 2) \cup (2, +\infty)$

