

الف) $y = \frac{x+1}{3x^2-10x+12x-10}$ $D_f = \mathbb{R} - \{1, \frac{5}{3}\}$
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 $3x^2-10x+12x-10 = 3x^2+2x-10$
 $3x^2+2x-10 = 0 \Rightarrow x = \frac{-2 \pm \sqrt{4+120}}{6} = \frac{-2 \pm 11}{6}$
 $x = 1, \frac{5}{3}$
 $\Delta = 4+120 = 124$

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الف) $y = \frac{x+1}{x-\sqrt{3-2x}}$ $\Rightarrow x^2-3x-2 = 0 \Rightarrow x = 1, 2$
 $\Rightarrow D_f = [-\infty, \frac{3}{2}] - \{1\}$

ب) $y = \frac{x+1}{x-\sqrt{3-2x}}$ $\Rightarrow x^2-3x-2 = 0 \Rightarrow x = 1, 2$
 $\Rightarrow D_f = [\frac{3}{2}, \infty) - \{2, 1\}$

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

الف) $x^2-4x+4 > 0 \Rightarrow x = 2, 1 \Rightarrow D = (-\infty, 1) \cup (2, \infty)$
 ب) $x^2-4x+4 < 0 \Rightarrow x = 2, 1 \Rightarrow D = (1, 2)$
 ج) $x^2+4x+4 \geq 0 \Rightarrow x = -2, -1 \Rightarrow D = (-\infty, -1] \cup [-2, \infty)$
 د) $x^2-4x+4 \leq 0 \Rightarrow x = 2, 1 \Rightarrow D = [1, 2]$

الف) $\frac{x^2-3x+1}{x-2} < 0 \Rightarrow x = 1, 2, 0 \Rightarrow D = (-\infty, 1) \cup (2, 0)$

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

$$الف) y = \sqrt{\frac{x^2 - 4x + 4}{x^2 - 1}} \Rightarrow x \neq \pm 1 \Rightarrow \frac{1}{1} - \frac{1}{-1} \Rightarrow D_f = [1, \infty)$$

$$ب) y = \sqrt{\frac{x^2 - 4x + 4}{x^2 - 1}} \Rightarrow D_f = \mathbb{R} - \{1, -1\}$$

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

$$ب) \log \frac{x^2}{|x| - 2} \Rightarrow |x| > 2 \Rightarrow x > 2, x < -2 \Rightarrow D_f = (-\infty, -2) \cup (2, \infty)$$

$$ج) y = \log \frac{x^2 - 5x + 4}{x^2 - 1} \Rightarrow x \neq \pm 1, x \neq 4, x \neq 1 \Rightarrow D_f = (1, 4) \cup (4, \infty)$$

$$د) y = \sqrt{x^2 - 1} \log x \Rightarrow x > 1, x > 0 \Rightarrow D_f = (1, \infty)$$

$$y = \frac{x^2 - x}{x^2 + x} \Rightarrow \frac{1}{1} - \frac{1}{0} \Rightarrow D_f = \mathbb{R} - \{0, -1\}$$

	+	-	+	+
$x^2 + x$	+	-	+	+
$x^2 - x$	+	+	-	+
$f(x)$	+	-	-	+

$$y = \sqrt{\frac{x - f(x)}{f(x)}} \Rightarrow \frac{x - f(x)}{f(x)} \geq 0, f(x) \neq 0 \Rightarrow D_f = [-1, -1] \cup (1, \infty)$$

$$f(x) \neq 0 \Rightarrow x \neq 1, 0$$

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

$$x - f(x) = 0 \Rightarrow x = f(x) \Rightarrow x = 1, 0$$

