

الف)  $y = \frac{x+5}{x^3-2x^2+3x-1}$   $\Rightarrow$   $\frac{x+5}{x^3-2x^2+3x-1} = \frac{Ax^2+Bx+C}{x^3-2x^2+3x-1}$

$$\begin{array}{r} x^3-2x^2+3x-1 \\ - (x^3+5x^2) \\ \hline -7x^2+3x-1 \\ + 7x^2-35x \\ \hline -32x-1 \\ + 32x+160 \\ \hline 159 \end{array}$$

$\Rightarrow D_f = R - \{1, \frac{5}{3}, \frac{1}{3}\}$

ب)  $y = \frac{x+3}{3x^3-x^2-1}$   $\Rightarrow$   $\frac{x+3}{3x^3-x^2-1} = \frac{Ax^2+Bx+C}{3x^3-x^2-1}$

$$\begin{array}{r} 3x^3-x^2-1 \\ - (3x^3+3x^2+3x) \\ \hline -4x^2-3x-1 \\ + 4x^2+12x+4 \\ \hline 9x+3 \end{array}$$

$\Rightarrow D_f = R - \{-1, -\frac{1}{3}, 1\}$

الف)  $y = \frac{x+1}{x-\sqrt{3-2x}}$   $\Rightarrow$   $x-\sqrt{3-2x} \neq 0 \Rightarrow x \neq \sqrt{3-2x} \Rightarrow x^2 \neq 3-2x \Rightarrow (x+3)(x-1) \neq 0$

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

$\Rightarrow D_f = (-\infty, \frac{1}{3}] \cup [\frac{2}{3}, +\infty) - \{1, 2\}$

الف)  $y = \frac{\sin x}{2\cos x-1}$   $\Rightarrow$   $2\cos x-1 \neq 0 \Rightarrow \cos x \neq \frac{1}{2} \Rightarrow D_f = R - \{2k\pi \pm \frac{\pi}{3}\}$

ب)  $y = \frac{\cos x+1}{2\sin x+1}$   $\Rightarrow$   $2\sin x+1 \neq 0 \Rightarrow \sin x \neq -\frac{1}{2} \Rightarrow D_f = R - \{2k\pi - \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}\}$

ج)  $y = \frac{\tan x+2}{\cot x-1}$   $\Rightarrow$   $\cos x \neq 0$   
 $\sin x \neq 0$   
 $\cot x-1 \neq 0 \Rightarrow \cot x \neq 1$

$\Rightarrow D_f = R - \{\frac{k\pi}{2}, k\pi + \frac{\pi}{4}\}$

د)  $y = \frac{\sin x+1}{\sin^2 x-2}$   $\Rightarrow$   $\sin^2 x-2 \neq 0 \Rightarrow \sin^2 x \neq 2 \Rightarrow \sin x \neq \pm \sqrt{2} \Rightarrow D_f = R - \{k\pi + \frac{\pi}{4}, k\pi + \frac{5\pi}{4}\}$

الف)  $x^2-\omega x+2 > 0 \Rightarrow (x-1)(x-2) > 0 \Rightarrow D_f = (-\infty, 1) \cup (2, +\infty)$

ب)  $x^2-4x+\omega < 0 \Rightarrow (x-1)(x-\omega) < 0 \Rightarrow D_f = (1, \omega)$

ج)  $x^2+4x+\omega > 0 \Rightarrow (x+1)(x+\omega) > 0 \Rightarrow D_f = (-\infty, -\omega] \cup [-1, +\infty)$

د)  $x^2-\sqrt{x}+2 < 0 \Rightarrow (x-1)(x-4) < 0 \Rightarrow D_f = [1, 4]$

$$\text{الف) } \frac{x^2 - 3x + 2}{x - 2} \left\{ \begin{array}{l} x-1=0 \Rightarrow x=1 \\ x-2=0 \Rightarrow x=2 \end{array} \right\} \Rightarrow \frac{(x-1)(x-2)}{x-2} \left\{ \begin{array}{l} x-1=0 \Rightarrow x=1 \\ x-2=0 \Rightarrow x=2 \end{array} \right\} \Rightarrow D_f = (-\infty, 1) \cup (2, \infty)$$

$$\text{ب) } \frac{x^2 - 1}{x^2 - 2x + 2} \left\{ \begin{array}{l} x-1=0 \Rightarrow x=1 \\ x-2=0 \Rightarrow x=2 \end{array} \right\} \Rightarrow \frac{(x-1)(x+1)}{(x-1)(x-2)} \left\{ \begin{array}{l} x-1=0 \Rightarrow x=1 \\ x-2=0 \Rightarrow x=2 \end{array} \right\} \Rightarrow D_f = (-\infty, -1] \cup (2, +\infty)$$

$$\text{الف) } y = \sqrt{\frac{x^2 - 5x + 3}{x^2 - 1}} \Rightarrow \frac{x^2 - 5x + 3}{x^2 - 1} \geq 0 \Rightarrow \frac{(x-1)(x-4)}{x^2 - 1} \geq 0 \Rightarrow D_f = [3, +\infty)$$

$$\text{ب) } y = \sqrt[3]{\frac{x^2 - 5x + 3}{x^2 - 1}} \Rightarrow x^2 - 1 \neq 0 \Rightarrow x^2 \neq 1 \Rightarrow x \neq \pm 1 \Rightarrow D_f = \mathbb{R} - \{\pm 1\}$$

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

$$\text{ب) } y = \log \frac{1-x^2}{|x|-2} \Rightarrow \left\{ \begin{array}{l} 1-x^2 > 0 \Rightarrow x^2 < 1 \Rightarrow -1 < x < 1 \\ |x|-2 > 0 \Rightarrow |x| > 2 \Rightarrow x > 2 \text{ or } x < -2 \\ |x|-2 \neq 0 \Rightarrow |x| \neq 2 \Rightarrow x \neq \pm 2 \end{array} \right\} \Rightarrow D_f = (-\infty, -2) \cup (2, \infty) - \{\pm 2\}$$

$$\text{ج) } y = \log \frac{x^2 - 3x + 2}{1-x} \Rightarrow \left\{ \begin{array}{l} x^2 - 3x + 2 > 0 \Rightarrow (x-1)(x-2) > 0 \\ 1-x > 0 \Rightarrow x < 1 \\ 1-x \neq 0 \Rightarrow x \neq 1 \end{array} \right\} \Rightarrow D_f = (2, 1.0) - \{1\}$$

$$\text{د) } y = \sqrt{x^2 - 11x + 21} + \log x \Rightarrow \left\{ \begin{array}{l} x^2 - 11x + 21 \geq 0 \Rightarrow (x-3)(x-7) \geq 0 \\ x > 0 \\ x \neq 0 \end{array} \right\} \Rightarrow D_f = (0, 3] \cup [7, \infty) - \{0\}$$

$$y = \frac{x^2 - x}{x^2 + x} \Rightarrow \frac{x(x-1)}{x(x+1)} \Rightarrow \left\{ \begin{array}{l} x=0 \\ x-1=0 \Rightarrow x=1 \\ x+1=0 \Rightarrow x=-1 \end{array} \right\}$$

|           |   |   |   |   |   |
|-----------|---|---|---|---|---|
| $x^2 - x$ | + | + | + | + | + |
| $x^2 + x$ | + | + | + | + | + |
| $p(x)$    | + | + | + | + | + |

$$y = \sqrt{\frac{x-f(x)}{f(x)}} \Rightarrow \left\{ \begin{array}{l} x-f(x) \geq 0 \\ f(x) > 0 \\ f(x) \neq 0 \end{array} \right\} \Rightarrow D_f = (-2, -1] \cup (2, 3]$$

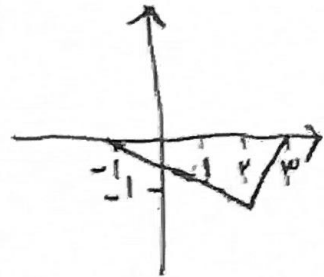
الف)  $f(x)+1 \Rightarrow$



ب)  $f(x-1) \Rightarrow$



ج)  $-f(x) \Rightarrow$



د)  $f(x+1)+2 \Rightarrow$

