

أ) $\frac{x+2}{x^3-10x^2+17x-10} =$

$$\begin{array}{r} x^3-10x^2+17x-10 \overline{) x^3-10x^2+17x-10} \\ \underline{-x^3+10x^2-17x+10} \\ 0 \end{array}$$

$\Rightarrow \frac{x+2}{(x-1)(x-2)(x-5)}$

$D_f = \mathbb{R} - \left\{ \frac{1}{5}, \frac{2}{3}, 1 \right\}$

ب) $\frac{x+1}{x^3-x^2-11x-6}$

$$\begin{array}{r} x^3-x^2-11x-6 \overline{) x^3-x^2-11x-6} \\ \underline{-x^3+x^2+11x+6} \\ 0 \end{array}$$

$D_f = \mathbb{R} - \left\{ 1, -1, -\frac{2}{3} \right\}$

$y = \frac{y}{x} \leftarrow (x-1)(x+1) \rightarrow -\frac{y}{x}$

أ) $\frac{x+1}{x-\sqrt{3-2x}} =$

$3-2x \geq 0$

$2x \leq 3 \Rightarrow x \leq \frac{3}{2}$

$x - \sqrt{3-2x} \neq 0$

$x^2-3+2x \neq 0$

$(x+1)(x-1) \neq 0$

$D_f = (-\infty, \frac{3}{2}] - \{-1, 1\}$

ب) $\frac{x+1}{x-\sqrt{3x-2}} =$

$3x-2 \geq 0$

$3x \geq 2 \Rightarrow x \geq \frac{2}{3}$

$x - \sqrt{3x-2} \neq 0$

$x^2-3x+2 \neq 0$

$(x-1)(x-2) \neq 0$

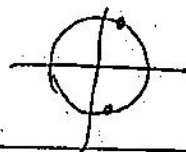
$D_f = [\frac{2}{3}, +\infty) - \{1, 2\}$

أ) $y = \frac{\sin x}{\cos x - 1}$

$\cos x - 1 \neq 0$

$\cos x \neq 1$

$D_f = \mathbb{R} - \left\{ 2k\pi \pm \frac{\pi}{2} \right\}$

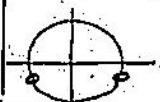


ب) $y = \frac{\cos x + 1}{\sin x + 1}$

$\sin x + 1 \neq 0$

$\sin x \neq -1$

$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{3\pi}{2}, 2k\pi + \frac{5\pi}{2} \right\}$



ج) $y = \frac{\tan x + 1}{\cos x - 1}$

$\cos x - 1 \neq 0$

$\cos x \neq 1$

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

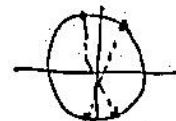


د) $y = \frac{\sin x + 1}{\sin^2 x - 1}$

$\sin^2 x - 1 \neq 0$

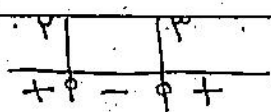
$\sin x \neq \pm 1$

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



أ) $x^2-5x+6 > 0$

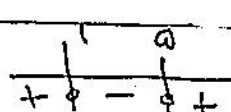
$(x-2)(x-3)$



$(-\infty, 2) \cup (3, +\infty)$

ب) $x^2+4x+5 < 0$

$(x+1)(x+5)$



$(-1, -5)$

ج) $x^2+4x+5 \geq 0$

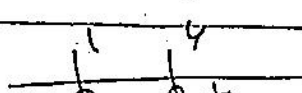
$(x+1)(x+5)$



$(-\infty, -1] \cup [-5, +\infty)$

د) $x^2-11x+10 < 0$

$(x-1)(x-10)$



$(1, 10)$

ا) $\frac{x^2 - x + 1}{x - 1} \geq 0$ $\frac{(x-1)(x-1)^2}{x-1} \geq 0$

$\frac{-1}{-1} \frac{+}{-1} \frac{+}{-1}$

$(-\infty, 1) \cup (1, \infty)$

ب) $\frac{x^2 - 1}{x^2 - 1} \geq 0$ $\frac{(x-1)(x+1)}{(x-1)(x+1)} \geq 0$

$\frac{-1}{+1} \frac{+}{-1} \frac{+}{-1}$ $(-\infty, -1] \cup (1, \infty)$

ا) $\sqrt{\frac{x^2 - 1}{x^2 - 1}} = \frac{(x-1)(x+1)}{(x-1)(x+1)} \geq 0$

$\frac{-1}{-1} \frac{+}{-1} \frac{+}{-1}$

$D_f = [1, \infty)$

ب) $\sqrt{\frac{x^2 - 1}{x^2 - 1}}$ $x^2 - 1 \geq 0$
 $x^2 \neq 1$
 $x \neq \pm 1$

$D_f = \mathbb{R} - \{\pm 1\}$

ا) $\log(x^2 - 1)$ $x^2 - 1 > 0$
 $x(x-1) > 0$

$\frac{+}{-1} \frac{-}{-1} \frac{+}{-1}$

$D_f = (-\infty, -1) \cup (1, \infty)$

ب) $\log \frac{1-x}{|x|-1}$ $1-x > 0$
 $-1 < x < 1$
 $|x|-1 > 0$ $|x| > 1$
 $x > 1$ $x < -1$

$D_f = (1, 1) \cup (-1, -1) = \emptyset$

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

$\frac{+}{-1} \frac{-}{-1} \frac{+}{-1}$

$1-x > 0$
 $x < 1$

$1-x \neq 0$ $x \neq 1$ $D_f = (1, 1) - \{1\} = \emptyset$

د) $\sqrt{x^2 - 1} + \log \frac{1-x}{|x|-1}$

$(x-1)(x+1) > 0$ $\sqrt{x^2 - 1} > 0$
 $x^2 - 1 > 0$
 $-1 < x < 1$
 $x > 0$
 $x \neq 1$

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

هـ) $y = \frac{x^2 - x}{x^2 + x} = \frac{x(x-1)}{x(x+1)}$ $\frac{-1}{+1} \frac{0}{-1} \frac{+}{-1}$

$(-\infty, -1) \cup [1, \infty)$

	-1	0	
$x(x-1)$	-	-	+
$x(x+1)$	-	+	+
$D_f(x)$	+	-	+

$\Rightarrow D_f = (-\infty, -1) \cup [1, \infty)$

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

$\frac{-1}{-1} \frac{+}{-1} \frac{+}{-1}$

$D_f = [-1, -1] \cup (1, 1] = \emptyset$

