

الف)  $y = \frac{n+2}{x^2-2x+1-n}$   $= \frac{n+2}{(x-1)(x-2)(x-n)}$   $\neq 0$   $\begin{matrix} x \neq 1 & x \neq 2 & x \neq n \end{matrix}$   $\mathbb{R} - \{1, 2, n\}$

ب)  $y = \frac{n+2}{x^2-2x+1-n}$   $= \frac{n+2}{(x-1)(x-2)(x-n)}$   $\neq 0$   $\begin{matrix} x \neq 1 & x \neq 2 & x \neq n \end{matrix}$   $\mathbb{R} - \{-1, 2, \frac{2}{n}\}$

الف)  $y = \frac{n+1}{x-\sqrt{x^2-2x}}$   $x-\sqrt{x^2-2x} \neq 0$   $x \geq 2$   $x \neq \sqrt{x^2-2x}$   $x \leq \frac{2}{x}$   $x^2+2x-2 \neq 0$   $(x+2)(x-1)$   $D_f = (-\infty, \frac{2}{x}] - \{1, -2\}$

ب)  $y = \frac{n+2}{x-\sqrt{x^2-2x}}$   $x-\sqrt{x^2-2x} \geq 0$   $x \geq 2$   $x \neq \sqrt{x^2-2x}$   $x^2-2x+2 \neq 0$   $(x-1)(x-2) \neq 0$   $x \geq \frac{2}{x}$   $D_f = [\frac{2}{x}, \infty) - \{1, 2\}$

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

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

ج)  $y = \frac{\tan x + x}{x \cot x - 1}$   $x \cot x - 1 \neq 0$   $\cot x \neq \frac{1}{x}$   $\cos x \neq 0$   $\sin x \neq 0$   $\frac{\cos x}{\sin x} \neq \frac{1}{x}$   $\mathbb{R} - \{k\pi, k\pi + \frac{\pi}{x}\}$

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

الف)  $x^2 - 4x + 4 > 0$   $(x-2)(x-2) > 0$   $(-\infty, 2) \cup (2, +\infty)$

ب)  $x^2 - 4x + 4 < 0$   $(x-1)(x-4) < 0$   $(1, 4)$

ج)  $x^2 + 4x + 4 \geq 0$   $(x+1)(x+4) \geq 0$   $(-\infty, -4] \cup [-1, +\infty)$

د)  $x^2 - 4x + 4 \leq 0$   $(x-1)(x-4) \leq 0$   $[1, 4]$

الف)  $\frac{x^2-2x+2}{x-1} \leq 0$   $\frac{(x-1)(x-2)}{x-1} < 0$   $(-\infty, 1) \cup (2, \infty)$

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

الف)  $y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 1}}$   $\frac{(x-1)(x-4)}{(x-1)(x^2+1)}$   
 $x \neq 1$

$D_f = [4, +\infty)$

ب)  $y = \sqrt{\frac{x^2 - 5x + 4}{x^2 - 1}}$   $x^2 - 1 \neq 0$   $x \neq \pm 1$

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

الف)  $y = \log(x^2 - 5x)$   $x^2 - 5x > 0$   $x(x-5) > 0$

$D_f = (-\infty, 0) \cup (5, +\infty)$

ب)  $y = \log(14 - x^2)$   $14 - x^2 > 0$   $x^2 < 14$   $-\sqrt{14} < x < \sqrt{14}$

ج)  $y = \log|x-5|$   $|x-5| > 0$   $x \neq 5$   $D_f = (-\infty, 5) \cup (5, +\infty)$

د)  $y = \log \frac{x^2 - 5x + 4}{x^2 - 1}$   $\frac{(x-1)(x-4)}{(x-1)(x^2+1)} > 0$   $x \neq 1$   $x > 4$

$D_f = (-\infty, 0) \cup (4, 5)$

هـ)  $y = \sqrt{x^2 - 11x + 28} + \log x$   $x^2 - 11x + 28 > 0$   $x > 0$   $D_f = (0, 4) \cup (7, +\infty)$

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

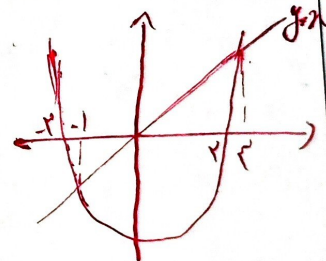
$D_f = \mathbb{R} - \{0, -1\}$

أبواب

|      |    |   |   |   |
|------|----|---|---|---|
|      | -1 | 0 | 1 |   |
| x    | -  | - | + | + |
| x-1  | -  | - | - | + |
| x+1  | -  | + | + | + |
| P(x) | +  | - | - | + |

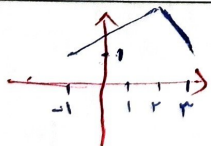
$y = \sqrt{\frac{x-f(x)}{f(x)}}$   $f(x) \neq 0$

$D_f = (0, 1] \cup [5, +\infty)$



$D_f = (0, 1] \cup [5, +\infty)$

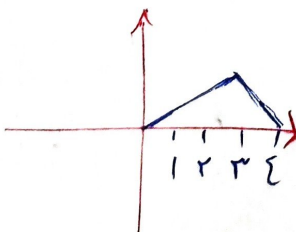
الف)  $f(x)+1$



ج)  $-f(x)$



ب)  $f(x-1)$



د)  $f(x+1)+2$

