

الف) $y = \sqrt{\frac{x^2 - 4x}{x^2 - x}} \Rightarrow x^2 - x \neq 0$ $x^2 - 4x \geq 0$ $x(x-4) \geq 0$

$x(x-1) \neq 0$ $x(x-4) \geq 0$

$x \neq 0, 1$ $x \leq 0$ or $x \geq 4$

$D_f = (-1, 1) \cup [4, +\infty)$

ب) $y = \sqrt{\frac{x^5 - x^3}{x^2 - x}} \Rightarrow x^2 - x \neq 0$ $x^5 - x^3 \geq 0$

$x(x-1) \neq 0$ $x^3(x^2-1) \geq 0$

$x \neq 0, 1$ $x \leq -1$ or $x \geq 1$

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

الف) $y = \frac{x+1}{\sqrt{x+|x|}} \Rightarrow x+|x| \neq 0$ $|x| - x \geq 0$ $D_f = (0, +\infty)$

ب) $y = \frac{1}{\sqrt{x|x|}} \Rightarrow x|x| \neq 0$ $D_f = (0, +\infty)$

الف) $y = \sqrt{2-[x]}$ $2-[x] \geq 0$ $D_f = (-\infty, 2)$

$[x] \leq 2$

ب) $y = \frac{1}{\sqrt{2-[x]}} \Rightarrow 2-[x] \neq 0$ $D_f = (-\infty, 2)$

الف) $y = \sqrt{[x - \frac{1}{r}] + [x + \frac{r}{r}]}$ $x - \frac{1}{r} \geq 0$ $x + \frac{r}{r} \geq 0$

$x \geq \frac{1}{r}$ $x \geq -\frac{r}{r}$

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

ب) $y = \sqrt{[x - \frac{1}{r}] + [-x + \frac{1}{r}]}$ $x - \frac{1}{r} \geq 0$ $-x + \frac{1}{r} \geq 0$

$x \geq \frac{1}{r}$ $x \leq \frac{1}{r}$

$D_f = \mathbb{R}$

الف) $y = \frac{r}{\sin x - 1} \Rightarrow \sin x - 1 \neq 0$ $\sin x \neq 1$

$D_f = \{2k\pi + \frac{\pi}{r}\}$

ب) $y = \frac{r}{r \sin x - 1} \Rightarrow r \sin x - 1 \neq 0$

$r \sin x \neq 1$

$\sin x \neq \frac{1}{r}$

$\sin x \neq \frac{\sqrt{r}}{r}$

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

$$الف) y = \sqrt{x \sin x - 1}$$

$$x \sin x - 1 \geq 0$$

$$x \sin x \geq 1$$

$$\sin x \geq \frac{1}{x}$$



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

$$ب) y = \sqrt{\cos x - 1}$$

$$\cos x - 1 \geq 0$$

$$\cos x \geq 1$$



$$D_f = \{2k\pi\}$$

$$الف) \cos y = |x| - 3$$

$$-1 \leq |x| - 3 \leq 1$$

$$2 \leq |x| \leq 4 \quad D_f = [-4, -2] \cup [2, 4]$$

$$ب) y = \arcsin(x^2 + 2x + 1)$$

$$x^2 + 2x + 1 \leq 1 \rightarrow x^2 + 2x \leq 0 \quad x(x+2) \leq 0$$

$$جواب = [-2, -1] \cup [0, 1]$$

$$x^2 + 2x + 1 \geq -1 \quad x^2 + 2x + 2 \geq 0 \quad (x+1)(x+2) \geq 0$$

$$الف) y = \sqrt{2 - \log_r(x-2)}$$

$$x-2 > 0$$

$$x > 2$$

$$2 - \log_r(x-2) \geq 0$$

$$x-2 \leq 9 \rightarrow x \leq 11$$

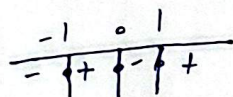
$$\log_r(x-2) \leq 2$$

$$D_f = (2, 11]$$

$$ب) y = \log(x^2 - x)$$

$$x^2 - x > 0$$

$$x(x-1) > 0$$



$$(-1, 0) \cup (1, +\infty)$$

$$الف) y = \frac{x}{x^2 + 1} \quad D_f = \mathbb{R}$$

$$ب) y = \frac{x}{x^2 - 1} \quad x^2 - 1 \neq 0 \quad D_f = \mathbb{R} - \{1, -1\}$$

$$ج) y = \frac{x}{x^2 - 2} \quad x^2 - 2 \neq 0 \quad \log_r \frac{x}{x^2 - 2} = \frac{1}{r} \quad D = \mathbb{R} - \left\{ \frac{1}{r} \right\}$$

$$د) y = \frac{x}{x^2 - 3} \quad x^2 - 3 \neq 0 \rightarrow \log_r \frac{x}{x^2 - 3} \quad D_f = \mathbb{R} - \left\{ \log_r \frac{1}{r} \right\}$$

$$g = (f_{x+1})!$$

$$f_{x+1} \in W$$

$$f_x \in W-1 \quad x \in \frac{W-1}{r} \quad \{x \mid x = \frac{k-1}{r}, k \in W\}$$

$$g = \left(\frac{rx-1}{rx-0} \right)! \quad \frac{rx-1}{rx-0} \in W \rightarrow rx-1 \in rxW-0W$$

$$\{x \mid x = \frac{rxk-0k+1}{r}, k \in W\}$$

$$rx \in rxW-0W+1$$

$$x \in \frac{rxW-0W+1}{r}$$