

الف) $\sqrt{\frac{x^2-4x}{x^2-x}} \geq 0$ $\frac{x(x-4)}{x(x-1)}$ $\frac{-1}{-} \frac{0}{+} \frac{1}{+} \frac{4}{-}$ $D_f = (-1) \cup [4, +\infty)$

ب) $\sqrt{\frac{x^2-x}{x^2-x}} \geq 0$ $\frac{x(x-1)}{x(x-1)}$ $\frac{-1}{+} \frac{0}{+} \frac{1}{+}$ $D_f = \mathbb{R}$

الف) $y = \frac{x+1}{\sqrt{x+1}}$ $\frac{-1}{+} \frac{0}{+} \frac{1}{+}$ $D_f = \mathbb{R}^+$

ب) $\frac{1}{\sqrt{x+1}}$ $\frac{+}{+} \frac{+}{+} \frac{-}{+}$ $D_f = \mathbb{R}^+$

الف) $y = \sqrt{2-x}$ $D_f = (-\infty, 2]$ خوب تر باشد

ب) $y = \frac{1}{\sqrt{2-x}}$ $D_f = (-\infty, 2)$ نه شود

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

ب) $y = \sqrt{x - \frac{1}{x}} + \sqrt{-x + \frac{1}{x}}$ $D_f = \left[-\frac{1}{4}, +\infty\right)$ $\frac{x + \frac{1}{x}}{x - \frac{1}{x}} \geq \frac{1}{x}$ $D_f = \left\{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\right\}$ $\frac{1}{x} \in \mathbb{Z}$ $x \in \mathbb{Z} + \frac{1}{x}$

الف) $\frac{x}{\sin x - 1}$ $\sin x - 1 \neq 0$ $\sin x \neq 1$ $D_f = \mathbb{R} - \left\{2k\pi + \frac{\pi}{2}\right\}$

ب) $y = \frac{x}{x \sin x - 1}$ $x \sin x - 1 \neq 0$ $x \sin x \neq 1$ $\sin x \neq \frac{1}{x}$ $\frac{-\sqrt{2}}{2}, \frac{\sqrt{2}}{2}$ $D_f = \mathbb{R} - \left\{\frac{k\pi}{2} + \frac{\pi}{4}\right\}$

الف) $y = \sqrt{y \sin x - 1}$

$y \sin x - 1 \geq 0$
 $y \sin x \geq 1$
 $\sin x \geq \frac{1}{y}$

$D_f = \{y \mid y \geq 1, y \neq 2\}$

ب) $y = \sqrt{\cos x - 1}$

$\cos x - 1 \geq 0$
 $\cos x \geq 1$
 $D_f = \mathbb{R}$

الف) $\cos y = |x| - 1$ $-1 \leq |x| - 1 \leq 1$ $-2 \leq |x| \leq 2$

$D_f = \{x \mid -2 \leq x \leq 2, x \in \mathbb{R}\}$

ب) $y = \arcsin(x^2 + 1)$ $-1 \leq x^2 + 1 \leq 1$

$x^2 + 1 \leq 1 \Rightarrow x^2 \leq 0$
 $x = 0$

$\frac{1}{x^2 + 1}$

$D_f = [-1, 1] \cup [1, 0]$

الف) $y = \sqrt{x \log(x-1)}$

$x-1 > 0 \Rightarrow x > 1$
 $x \log(x-1) \geq 0$
 $\log(x-1) \geq 0$

$D_f = [2, +\infty)$

ب) $\log(x^2 - x)$

$x^2 - x > 0$
 $x(x-1) > 0$

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

الف) $y = \frac{x}{e^x + 1}$ $e^x + 1 \neq 0$ $e^x \neq -1$ $D_f = \mathbb{R}$

ب) $y = \frac{x}{e^x - 1}$ $e^x - 1 \neq 0$ $e^x \neq 1$ $x \neq \log 1$ $D_f = \mathbb{R} - \{0\}$

ج) $y = \frac{x}{e^x - 2}$ $e^x - 2 \neq 0$ $e^x \neq 2$ $x \neq \log 2$ $D_f = \mathbb{R} - \{\log 2\}$

د) $y = \frac{x}{e^x - 3}$ $e^x - 3 \neq 0$ $e^x \neq 3$ $x \neq \log 3$ $D_f = \mathbb{R} - \{\log 3\}$

الف) $y = (x+1)!$ $x+1 \in \mathbb{N}$ $x \in \mathbb{N} - 1$ $D_f = \{x \mid x = k-1, k \in \mathbb{N}\}$

ب) $y = \left(\frac{x-1}{x-2}\right)!$ $\frac{x-1}{x-2} \in \mathbb{N}$ $x-1 \in \mathbb{N}$ $x-2 \in \mathbb{N}$ $x \in \mathbb{N}$ $D_f = \{x \mid x = k, k \in \mathbb{N}\}$