

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

$$\therefore y = \sqrt{\frac{x^3 - x^4}{x^5 - x}} = \sqrt{\frac{x^3(x^3 - 1)}{x(x^5 - 1)}} = \sqrt{\frac{x^3(x+1)(x-1)}{x(x+1)(x-1)}} = \frac{-1^* \ 0^* \ 1^*}{+ \frac{1}{x} + \frac{1}{x} + \frac{1}{x} +} \left\{ D_f = \mathbb{R} - \{-1, 0, 1\} \right\}$$

$$\text{الف) } y = \frac{x+1}{\sqrt{x+|x|}} \quad \sqrt{x+|x|} \neq 0 \rightarrow x \in \mathbb{R}^+ \quad \left. \vphantom{\frac{x+1}{\sqrt{x+|x|}}} \right\} D_f = \mathbb{R}^+$$

$$\left. \begin{aligned} & \frac{1}{\sqrt{x|x|}} \rightarrow \frac{x|x|}{x|x|} \\ & \frac{x|x|}{x|x|} > 0 \end{aligned} \right\} D_f = \mathbb{R}^+ \quad \left\{ \begin{aligned} & x \in \mathbb{R}^+ \end{aligned} \right\}$$

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

$$\therefore y = \frac{1}{\sqrt{x-[x]}} \quad x - [x] > 0 \quad x > [x] \rightarrow x \rightarrow 0_f = (-\infty, 1)$$

$$y = \sqrt{\left[x - \frac{1}{x}\right] + \left[x + \frac{y}{x}\right]} \quad \sqrt{\left[x + \frac{y}{x}\right] - 1} \quad \sqrt{\left[x + \frac{y}{x}\right] - 1} \geq 0$$

$y = \sqrt{\frac{x - \frac{1}{p}}{x}}$

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منفی
 در صورتی
 عبارت درون
 پرانتز صحیح باشد

$x - \frac{1}{p} \geq 0$
 $x \geq \frac{1}{p}$
 $x \in \mathbb{Z} + \frac{1}{p}$
 $D_f = \{k + \frac{1}{p} \mid k \in \mathbb{Z}\}$

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

$$\left. \begin{aligned} & y = \sqrt[r]{\sin x - 1} \Rightarrow \sin x - 1 \neq 0 \quad \sin x \neq 1 \\ & \sin x \neq \frac{1}{r} \\ & \sin x \neq \pm \frac{\sqrt{r}}{r} \end{aligned} \right\} D_f = \mathbb{R} - \left\{ k\pi \pm \frac{\pi}{r} \right\}$$

الف) $y = \sqrt{2 \sin x - 1}$ $\left. \begin{array}{l} 2 \sin x - 1 \geq 0 \\ 2 \sin x \geq 1 \\ \sin x \geq \frac{1}{2} \end{array} \right\} D_f = \left[\frac{\pi}{6} + 2k\pi, \frac{5\pi}{6} + 2k\pi \right]$

ب) $y = \sqrt{\cos x - 1}$ $\left. \begin{array}{l} \cos x - 1 \geq 0 \\ \cos x \geq 1 \end{array} \right\} D_f = \{2k\pi\}$

الف) $\cos y = |x| - 2$ $\left. \begin{array}{l} -1 \leq |x| - 2 \\ |x| - 2 \leq 1 \\ -1 \leq |x| \\ |x| \leq 3 \\ -3 \leq x \leq 3 \end{array} \right\} D_f = [-3, -2] \cup [2, 3]$

ب) $y = \arcsin(x^2 + 2x + 1)$ $\left. \begin{array}{l} -1 \leq x^2 + 2x + 1 \\ x^2 + 2x + 1 \leq 1 \\ -2 \leq x^2 + 2x \\ 0 \leq x^2 + 2x \leq 2 \\ x(x+2) \in [0, 2] \end{array} \right\} D_f = [-2, 0] \cup [0, 2]$

$y = \sqrt{2 - \log_2(x-2)}$ $\left. \begin{array}{l} x-2 \geq 0 \\ x > 2 \\ 2 - \log_2(x-2) \geq 0 \\ \log_2(x-2) \leq 2 \\ x-2 \leq 4 \\ x \leq 6 \end{array} \right\} D_f = (2, 6]$

ب) $y = \log \frac{x^2 - x}{x(x+1)}$ $\left. \begin{array}{l} x(x+1)(x-1) > 0 \\ -1 < x < 1 \end{array} \right\} D_f = (-1, 0) \cup (1, +\infty)$

الف) $y = \frac{2}{x+1}$ $\left. \begin{array}{l} x+1 \neq 0 \\ x \neq -1 \end{array} \right\} D_f = \mathbb{R}$

ب) $y = \frac{2}{x-1}$ $\left. \begin{array}{l} x-1 \neq 0 \\ x \neq 1 \end{array} \right\} D_f = \mathbb{R} - \{1\}$

ج) $y = \frac{2}{x-2}$ $\left. \begin{array}{l} x-2 \neq 0 \\ x \neq 2 \end{array} \right\} D_f = \mathbb{R} - \{2\}$

د) $y = \frac{2}{x-3}$ $\left. \begin{array}{l} x-3 \neq 0 \\ x \neq 3 \end{array} \right\} D_f = \mathbb{R} - \{3\}$

الف) $y = (fx+1)! \Rightarrow \left. \begin{array}{l} fx+1 \in \mathbb{W} \\ fx \in \mathbb{W}-1 \\ x \in \frac{\mathbb{W}-1}{f} \end{array} \right\} D_f = \left\{ \frac{k-1}{f} \mid k \in \mathbb{W} \right\}$

ب) $y = \left(\frac{x^2-2}{x^2-5} \right)! \Rightarrow \left. \begin{array}{l} \frac{x^2-2}{x^2-5} \in \mathbb{W} \\ x^2-2 \in \mathbb{W} \\ x^2-5 \in \mathbb{W} \end{array} \right\} D_f = \left\{ \frac{k-2}{k-5} \mid k \in \mathbb{W} \right\}$

$\frac{-x^2\mathbb{W} + x^2\mathbb{W}}{x^2(x^2-5)} \in \mathbb{W} \Rightarrow \left. \begin{array}{l} x^2-2 \in \mathbb{W} \\ x^2-5 \in \mathbb{W} \end{array} \right\} D_f = \left\{ \frac{k-2}{k-5} \mid k \in \mathbb{W} \right\}$

$x \in \frac{\mathbb{W}-2}{\mathbb{W}-5}$