

$$\text{c) } y = \sqrt{\frac{x^2 - 4x}{x^2 - x}} \Rightarrow \frac{x^2 - 4x}{x^2 - x} \geq 0 \quad \begin{array}{c} -1 \quad 0 \quad +1 \quad 4 \\ - \frac{1}{x} + \frac{1}{x} + \frac{1}{x} - \frac{1}{x} + \end{array} \quad \begin{cases} x^2 - 4x = 0 \\ x(x-4) = 0 < 0 \\ x^2 - x = 0 \\ x(x-1) = 0 < +1 \end{cases}$$

$$\hookrightarrow y = \sqrt{\frac{n^{\omega} - n^{\mu}}{n^{\mu} - n}} \Rightarrow \frac{n^{\omega} - n^{\mu}}{n^{\mu} - n} \geq 0$$

$$D_f = \mathbb{R} - \{\pm 1, 0\} \quad \text{L.V.D.}$$

$$\begin{array}{c} \begin{array}{ccc} -1^* & 0^* & 1^* \\ + \text{---} + & + \text{---} + & + \text{---} + \\ \text{---} \text{---} \text{---} \end{array} \\ \begin{cases} n^{\omega} - n^{\mu} = 0 \\ n^{\mu}(n^{\mu} - 1) = 0 \end{cases} \begin{matrix} 0 \\ \pm 1 \end{matrix} \\ \begin{cases} n^{\mu} - n = 0 \\ n(n^{\mu} - 1) = 0 \end{cases} \begin{matrix} \pm 1 \\ 0 \end{matrix} \end{array}$$

$y = \frac{n+1}{\sqrt{n+|n|}}$
 $n+|n| > 0$
 $|n| > -n$
 $D_f = \mathbb{R}^+$

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$y = \sqrt{\nu - [n]}$ (الف)
 $\nu - [n] \gg 0$
 $[n] \ll \nu$
 $n \ll \mu$
 $D_f = (-\infty, \mu)$

$$\begin{aligned} \text{b)} \quad y &= \frac{1}{\sqrt{Y - [x]}} \\ Y - [x] &> 0 \\ [x] &< Y \\ x &< Y \\ D_f &= (-\infty, Y) \end{aligned}$$

$$y = \sqrt{\left[x - \frac{1}{\mu}\right] + \left[x + \frac{\nu}{\mu}\right]} \rightarrow \left[x - \frac{1}{\mu}\right] + \left[x + \frac{\nu}{\mu}\right] \geq 0 \Rightarrow \left[x + \frac{\nu}{\mu} - 1\right] + \left[x + \frac{\nu}{\mu}\right] \geq 0 \Rightarrow$$

$$\hookrightarrow y = \sqrt{\left[n - \frac{1}{w}\right] + \left[-n + \frac{1}{w}\right]} \Rightarrow \left[\frac{n - \frac{1}{w}}{a}\right] + \left[-\frac{\left(n - \frac{1}{w}\right)}{a}\right] \gg 0 \text{ if } \begin{cases} a \in \mathbb{Z} \circ \bar{0}\bar{0} \\ a \notin \mathbb{Z} - 1\bar{0}\bar{0}\bar{0} \end{cases}$$

$$y = \frac{p}{\sin x - 1} \quad \begin{matrix} \sin x - 1 \neq 0 \\ \sin x \neq 1 \end{matrix}$$

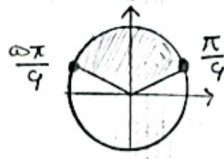
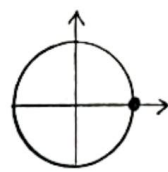
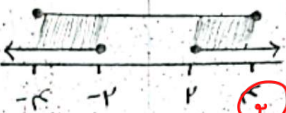
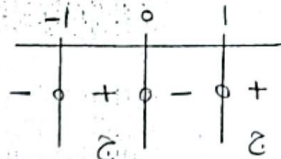
$$b) y = \frac{\mu}{\rho \sin^p x - 1} \quad \begin{matrix} \rho \sin^p x - 1 \neq 0 \\ \sin^p x \neq \frac{1}{\rho} \end{matrix}$$

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

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

$\sin u = \pm \frac{\sqrt{y}}{y}$



الف) $y = \sqrt{x \sin x - 1}$ $x \sin x - 1 \geq 0$ $\sin x \geq \frac{1}{x}$ $D_f = \left[2k\pi + \frac{\pi}{9}, 2k\pi + \frac{5\pi}{9} \right]$ 	ب) $y = \sqrt{\cos x - 1}$ $\cos x - 1 \geq 0$ $\cos x \geq 1$ $D_f = \mathbb{R} - \{2k\pi\}$ 	6
الف) $\cos y = x - 2$ $-1 \leq x - 2 \leq 1 \rightarrow 1 \leq x \leq 3$ $\{x \mid 1 \leq x \leq 3\} = x \geq 1 \cup x \leq -1$ $x \leq 3 \rightarrow -3 \leq x \leq 3$  $D_f = [-3, -1] \cup [1, 3]$	7	
ب) $\arcsin(x^2 + 2x + 1)$ $(x^2 + 2x + 1) \in [-1, 1]$ (I) $-1 \leq x^2 + 2x + 1 \leq 1$ $D_f = [-3, -1] \cup [-1, 0]$ (II) $x^2 + 2x + 1 \leq 1 \Rightarrow x^2 + 2x \leq 0 \Rightarrow x(x+2) \leq 0$ $x \in [-2, 0]$ (I) $x^2 + 2x + 1 \geq -1 \Rightarrow x^2 + 2x + 2 \geq 0$ $(x+1)^2 + 1 \geq 0$ always true.	8	
الف) $y = \sqrt{x - \log_{\mu}(x-2)}$ $x - 2 \geq 0 \Rightarrow x \geq 2$ $x - 2 \geq \log_{\mu}(x-2)$ $D_f = [2, 11]$	9	
ب) $\log(x^2 - x)$ $x^2 - x > 0 \Rightarrow x(x-1) > 0$ $D_f = (-1, 0) \cup (1, +\infty)$ 	10	
الف) $y = \frac{x}{x^n + 1}$ $x^n + 1 \neq 0$ $x^n \neq -1$ $D_f = \mathbb{R}$	11	
ب) $y = \frac{x}{x^n - 1}$ $x^n - 1 \neq 0$ $x^n \neq 1$ $x \neq 0$ $D_f = \mathbb{R} - \{0\}$	12	
ج) $y = \frac{x}{x^n - 2}$ $x^n - 2 \neq 0$ $x^n \neq 2 \Rightarrow x \neq \sqrt[n]{2}$ $x \neq 1 \Rightarrow x \neq \frac{1}{\sqrt[n]{2}}$ $D_f = \mathbb{R} - \left\{ \frac{1}{\sqrt[n]{2}}, \sqrt[n]{2} \right\}$	13	
د) $y = \frac{x}{x^n - \mu}$ $x^n - \mu \neq 0$ $x^n \neq \mu \Rightarrow x \neq \sqrt[n]{\mu}$ $D_f = \mathbb{R} - \{\log_{\mu} \mu\}$	14	
الف) $y = (x+1)!$ $x+1 \in \mathbb{N}$ $x \in \mathbb{N} - 1$ $x \in \frac{\mathbb{N}-1}{\kappa}$ $D_f = \left\{ x \mid x = \frac{k-1}{\kappa}, k \in \mathbb{N} \right\}$	15	
ب) $y = \left(\frac{x^n - \mu}{x - \omega} \right)!$ $\frac{x^n - \mu}{x - \omega} \in \mathbb{N}$ $x^n - \mu \in x\mathbb{N} - \omega\mathbb{N}$ $x^n - x\mathbb{N} \in -\omega\mathbb{N} + \mu$ $D_f = \left\{ x \mid x = \frac{-\omega k + \mu}{\psi - \gamma k}, k \in \mathbb{N} \right\}$	16	