

$$a) y = \frac{n+p}{p n^3 + p n^2 - 1 n + p} = \frac{n+p}{(n-1)(p n - 1)(n+p)} \quad (1)$$

$$\Rightarrow D_f = IR - \left\{ -\frac{1}{p}, \frac{1}{p} \right\}$$

$$\begin{array}{l} p n^3 + p n^2 - 1 n + p \left| \frac{n-1}{p n^2 + 0 n - p} \right. \\ - p n^3 + p n^2 \\ \hline - n + p \\ - p n + p \\ \hline \end{array}$$

$$b) y = \frac{n+p}{p n^3 + 9 n^2 + 10 n + p} = \frac{n+p}{(n+1)(p n + 1)(n+p)}$$

$$\Rightarrow D_f = IR - \left\{ -\frac{1}{p}, -1, -\frac{1}{p} \right\}$$

$$\begin{array}{l} p n^3 + 9 n^2 + 10 n + p \left| \frac{n+1}{p n^2 + 0 n + p} \right. \\ - p n^3 + 9 n^2 + 10 n + p \\ \hline \end{array}$$

$$a) y = \frac{n+p}{n^3 - p n^2 + p n - 1} = \frac{n+p}{(n-1)(n^2 - n + 1)} \Rightarrow D_f = IR - \{1\} \quad (2)$$

$\Delta < 0$

$$b) \sqrt{\frac{n+p}{n^3 - p n^2 + p n - 1}} \Rightarrow \frac{n+p}{(n-1)(n^2 - n + 1)} \geq 0 \Rightarrow \frac{-p}{+} - \frac{1}{+} +$$

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

$$\begin{array}{l} n^3 - p n^2 + p n - 1 \left| \frac{n-1}{n^2 - n + 1} \right. \\ - n^3 + p n^2 - p n + 1 \\ \hline - n^2 + p n - 1 \\ + n^2 - n \\ \hline - n + 1 \\ - n + 1 \\ \hline \end{array}$$

$$y = \frac{r}{n^2 - a |n-1| - p n + a} \Rightarrow n^2 - a |n-1| - p n + a \neq 0 \quad (3)$$

$$\begin{aligned} \xrightarrow{n \geq 1} \leq |n-1| = n-1 &\Rightarrow n^2 - a(n-1) - p n + a = n^2 - n + 1 \\ &\Rightarrow (n-a)(n-1) \neq 0 \rightarrow a, r \end{aligned}$$

$$\begin{aligned} \xrightarrow{n \leq 0} \leq |n-1| = 1-n &\Rightarrow n^2 - a(1-n) - p n + a = n^2 + n \\ &\Rightarrow n(n+1) \neq 0 \rightarrow 0, -\frac{1}{a} \end{aligned}$$

$$\Rightarrow D_f = IR - \left\{ -\frac{1}{a}, 0, 1, a \right\}$$

$$\text{الف) } y = \sqrt{[x] - 2} \Rightarrow [x] - 2 \geq 0 \Rightarrow [x] \geq 2 \quad (4)$$

$$\Rightarrow D_f = (-\infty, -2]$$

$$\text{ب) } y = \frac{2x^2 + 4}{[x]^2 - 2[x] - 6} \Rightarrow [x]^2 - 2[x] - 6 \neq 0$$

$$\rightarrow ([x] - 3)([x] + 2)$$

$$[x] = 3 \rightarrow 3 \leq x < 4 \Rightarrow D_f = \mathbb{R} - [-1, 0) \cup [3, 4)$$

$$[x] = -1 \rightarrow -1 \leq x < 0$$

$$\text{وا) } y = \sqrt{[x - \frac{1}{2}] + [x + \frac{1}{2}]} \quad (5)$$

$$\Rightarrow 2[x - \frac{1}{2}] + 1 \geq 0$$

$$2[x - \frac{1}{2}] \geq -1 \Rightarrow [x - \frac{1}{2}] \geq -\frac{1}{2} \Rightarrow [x - \frac{1}{2}] \geq 0$$

$$\Rightarrow x - \frac{1}{2} \geq 0 \Rightarrow x \geq \frac{1}{2} \Rightarrow D_f = [\frac{1}{2}, +\infty)$$

$$\text{ب) } y = \sqrt{[x - \frac{1}{2}] + [\frac{1}{2} - x]} \rightarrow \sqrt{[x] + [-x]}$$

$$[x] + [-x] = 0$$

$$x - \frac{1}{2} \in \mathbb{Z}$$

$$\rightarrow x \in \mathbb{Z} + \frac{1}{2} \Rightarrow D_f = \{x \mid x = k + \frac{1}{2}, k \in \mathbb{Z}\}$$



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$$\text{a) } y = \frac{\cos n + 1}{\tan n + 1} \quad \left\{ \begin{array}{l} \sin n \neq 0 \\ \cos n \neq 0 \\ \tan n \neq -1 \end{array} \right. \quad \mathbb{R} - \left\{ \frac{k\pi}{2}, k\pi - \frac{\pi}{2} \right\} \quad (9)$$

$$\text{b) } y = \sqrt{1 - 2\sin^2 n} \Rightarrow |\sin n| \leq 1 \Rightarrow \frac{1}{2} \geq \sin^2 n \Rightarrow$$

$$-\frac{1}{\sqrt{2}} \leq \sin n \leq \frac{1}{\sqrt{2}}$$


$$D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$$

$$\text{c) } y = \sqrt{2\sin n - 1} \Rightarrow \sin n \geq \frac{1}{2}$$

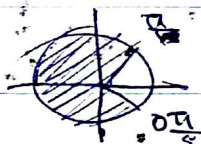
$$D_f = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$$



$$\text{d) } y = \sqrt{1 - \cos n} \Rightarrow \frac{1}{2} \geq \cos n$$

$$D_f = \mathbb{R} - \left(2k\pi - \frac{\pi}{3}, 2k\pi + \frac{\pi}{3} \right)$$

$$= D_f = \left[2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3} \right]$$



$$\text{e) } -1 \leq n^2 + n + 1 \leq 1$$

$$\text{a) } -1 \leq n^2 + n + 1 \Rightarrow 0 \leq (n+1)(n+2)$$

$$\text{b) } n^2 + n + 1 \leq 1 \Rightarrow n(n+1) \leq 0$$

$$D_f = [-2, -1] \cup [-1, 0]$$

$$\begin{array}{c} \frac{-1}{+} \frac{-1}{-} \frac{-1}{+} \\ \hline \frac{-1}{+} \frac{-1}{-} \frac{-1}{+} \end{array}$$

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Sub: GA

ب) $\cos y = \sqrt{\delta - \gamma n}$ $\textcircled{1} \Rightarrow 0 \leq \sqrt{\delta - \gamma n} \leq 1 \Rightarrow 0 \leq \delta - \gamma n \leq 1$

$\Rightarrow \delta - \gamma n \leq 1 \Rightarrow -\gamma n \leq -\delta + 1 \Rightarrow n \geq \frac{\delta - 1}{\gamma} \Rightarrow \delta - \gamma n \geq 0 \Rightarrow n \leq \frac{\delta}{\gamma}$

$\textcircled{2} \Rightarrow \delta - \gamma n \geq 0 \Rightarrow n \leq \frac{\delta}{\gamma} \Rightarrow D_f = \left[\frac{\delta - 1}{\gamma}, \frac{\delta}{\gamma} \right]$

الف) $y = \log_r (1 - \log_c^n)$ $\textcircled{9}$

$\textcircled{1} n > 0$ $\textcircled{2} 1 - \log_c^n > 0 \Rightarrow \log_c^n < 1 \Rightarrow n < c$

$\Rightarrow D_f = (0, c) / n \in (0, c)$

ب) $y = \log_r (1 - \log_{\frac{1}{r}}^n)$

$\textcircled{1} n > 0$ $\textcircled{2} 1 - \log_{\frac{1}{r}}^n > 0 \Rightarrow \log_{\frac{1}{r}}^n < 1 \Rightarrow n < \frac{1}{r}$

$\Rightarrow n \in (0, \frac{1}{r})$

الف) $y = \sqrt{\frac{\varepsilon n - n^2}{r} - 1}$ $\textcircled{10}$

$\frac{\varepsilon n - n^2}{r} - 1 \geq 0 \Rightarrow \frac{\varepsilon n - n^2}{r} \geq 1 \Rightarrow \varepsilon n - n^2 \geq r$

$\Rightarrow -n^2 + \varepsilon n - r \geq 0 \Rightarrow n^2 - \varepsilon n + r \leq 0 \Rightarrow (n-1)(n-c) \leq 0$

ب) $y = \left(\frac{\varepsilon n + \delta}{r n + \varepsilon} \right) ! + \frac{1}{1 - \frac{1}{r}} D_f = [1, c]$

$\frac{\varepsilon n + \delta}{r n + \varepsilon} \in W \Rightarrow n = - \frac{\varepsilon w - \delta}{r w - \varepsilon} \Rightarrow n = \frac{\delta - \varepsilon w}{r w - \varepsilon}$

$\Rightarrow D_f = \left\{ n = \frac{\delta - \varepsilon k}{r k - \varepsilon}, k \in W \right\}$