

$$y = \sqrt{r \sin n - 1} \rightarrow r \sin n - 1 \geq 0 \quad \sin n \geq \frac{1}{r} \quad D_f = \left[rk\pi + \frac{\pi}{4}, rk\pi + \frac{3\pi}{4} \right]$$



$$y = \sqrt{\cos n - 1} \quad \cos n - 1 \geq 0 \quad \cos n \geq 1 \quad D_f = \{rk\pi\}$$

الف) $\cos y = |n| - r \quad -1 \leq |n| - r \leq 1 \Rightarrow r \leq |n| \leq r+1$

$$D_f = [-r-1, -r] \cup [r, r+1] \quad -r-1 \leq n \leq -r \leq r \leq n \leq r+1$$

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

$$y = \arcsin(n^r + r^{n+1}) \quad -1 \leq n^r + r^{n+1} \leq 1 \quad (-\infty, -1] \cup [-1, +\infty)$$

$$\frac{r^n}{r^n + r^{n+1}} \leq 1$$

$$0 \leq n^r + r^{n+1} \leq 1 \rightarrow 0 \leq (n+r)(n+1) + 1 - 1 +$$

$$y = \sqrt{r \log(n-r)} \quad n-r > 0 \rightarrow n > r \quad D_f = (r, 11]$$

$$r - \log \frac{n-r}{r} \geq 0 \quad r \geq n-r \rightarrow n \leq 11$$

$$y = \log(n^r - n) \rightarrow n^r - n > 0 \rightarrow n(n^{r-1} - 1) > 0 \quad \frac{-1 \pm \sqrt{1+4}}{2} \quad (1, +\infty) \cup (-1, 0)$$

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

$$y = \frac{r^n}{r^n + 1} \rightarrow r^n + 1 \neq 0 \quad \epsilon^n \neq -1 \Rightarrow D_f = \mathbb{R}$$

$$y = \frac{r^n}{r^n - 1} \rightarrow r^n - 1 \neq 0 \quad \epsilon^n \neq 1 \Rightarrow D_f = \mathbb{R} - \{0\}$$

$$y = \frac{r^n}{r^n - r} \rightarrow r^n - r \neq 0 \quad \epsilon^n \neq r \Rightarrow D_f = \mathbb{R} - \{\log_r r\}$$

$$y = \frac{r^n}{r^n - r} \rightarrow \epsilon^n - r \neq 0 \quad \epsilon^n \neq r \Rightarrow D_f = \mathbb{R} - \{\log_r r\}$$

ب) $y = (\epsilon n + 1)!$ $\epsilon n + 1 \in \mathbb{N} \rightarrow n \in \frac{\mathbb{N} - 1}{\epsilon} \quad D_f = \{n | n = \frac{k-1}{\epsilon}, k \in \mathbb{N}\}$

$$\rightarrow y_n = \left(\frac{r^n - r}{r^n - \epsilon} \right)!$$

$$\frac{r^n - r}{r^n - \epsilon} \in \mathbb{N} \Rightarrow n \in -\frac{\epsilon \omega + r}{r \omega - r} = \frac{\epsilon \omega - r}{r \omega - r}$$

$$D_f = \{n | n = \frac{\epsilon k - r}{rk - r}, k \in \mathbb{N}\}$$

الف) $y = \sqrt{\frac{n^2-4n}{n^3-n}} \rightarrow \sqrt{\frac{n(n-4)}{n(n^2-1)}} \quad \begin{matrix} -1 & + & 1 & - & 4 \\ - & + & + & - & + \end{matrix} \quad (-1, 0) \cup (0, 1) \cup [4, +\infty)$

ب) $y = \sqrt{\frac{n^5-n^4}{n^3-n}} \rightarrow \sqrt{\frac{n^4(n-1)}{n(n^2-1)}} \quad \begin{matrix} -1 & + & 1 & - & 4 \\ + & + & + & - & + \end{matrix} \quad \mathbb{R} - \{-1, 0, 1\}$

الف) $y = \frac{n+1}{\sqrt{n+|n|}} \rightarrow n+|n| > 0 \quad \begin{matrix} + \rightarrow \checkmark \\ - \rightarrow \times \\ 0 \rightarrow \times \end{matrix} \quad \mathbb{R}^+$

ب) $y = \frac{1}{\sqrt{n|n|}} \rightarrow n|n| > 0 \quad \begin{matrix} + \rightarrow \checkmark \\ - \rightarrow \times \\ 0 \rightarrow \times \end{matrix} \quad \mathbb{R}^+$

الف) $y = \sqrt{2-[n]} \rightarrow 2-[n] \geq 0 \Rightarrow [n] \leq 2 \Rightarrow (-\infty, 3)$

ب) $y = \frac{1}{\sqrt{2-[n]}} \rightarrow 2-[n] > 0 \Rightarrow [n] < 2 \Rightarrow (-\infty, 2)$

الف) $\sqrt{[n-\frac{1}{r}]} + [n+\frac{r}{r}] \rightarrow [n-\frac{1}{r}] + [n+\frac{r}{r}] \geq 0 \quad [n+\frac{r}{r}] \geq \frac{1}{r}$
 $n+\frac{r}{r} \geq 1 \Rightarrow n \geq \frac{1}{r} \quad [n-\frac{1}{r}] + [n+\frac{r}{r}] \geq 0 \Rightarrow [n+\frac{r}{r}] \geq 1$
 $D_f = [\frac{1}{r}, +\infty)$

ب) $\sqrt{[n-\frac{1}{r}]} + [-n+\frac{1}{r}] \rightarrow [n-\frac{1}{r}] + [-(n-\frac{1}{r})] \geq 0 \Rightarrow n-\frac{1}{r} \in \mathbb{Z} \Rightarrow n \in \mathbb{Z} + \frac{1}{r}$
 $D_f = \{n | n = k + \frac{1}{r}, k \in \mathbb{Z}\}$

الف) $y = \frac{r}{\sin n - 1} \rightarrow \sin n - 1 \neq 0 \Rightarrow \sin n \neq 1 \Rightarrow \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$
 $D_f = \mathbb{R} - \{2k\pi + \frac{\pi}{2}\}$

ب) $y = \frac{r}{r \sin^2 n - 1} \rightarrow r \sin^2 n - 1 \neq 0 \Rightarrow \sin^2 n \neq \frac{1}{r} \Rightarrow \sin n \neq \pm \frac{\sqrt{r}}{r}$
 $D_f = \mathbb{R} - \{k\pi \pm \frac{\pi}{2}\}$