

۱۱/۱۵

الف) $y = \frac{\sin u - 2}{2 \cos u + 1} \rightarrow 2 \cos u + 1 \neq 0 \rightarrow 2 \cos u \neq -1 \rightarrow \cos u \neq -\frac{1}{2}$

$D_f = \mathbb{R} - \left\{ 2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3} \right\}$ (۱) ✓

ب) $y = \frac{\sin u + 2}{\cos u - 1} \rightarrow \cos u - 1 \neq 0 \rightarrow \cos u \neq 1 \rightarrow D_f = \mathbb{R} - \{2k\pi\}$

الف) $y = \frac{2 \sin u + 1}{\tan u + 1} \rightarrow \frac{\sin u}{\cos u} + 1 \neq 0 \rightarrow \frac{\sin u}{\cos u} \neq -1 \rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{3\pi}{4} \right\}$
 $\frac{2 \sin u}{\cos u} \neq -1$ (۱) $k\pi + \frac{3\pi}{4}$

ب) $y = \frac{\cos u + 1}{\cot u - 1} \rightarrow \frac{\cos u}{\sin u} - 1 \neq 0 \rightarrow \frac{\cos u}{\sin u} \neq 1 \rightarrow D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4} \right\}$
 $\frac{\cos u}{\sin u} \neq 1$ $k\pi$

الف) $\sin y = 2u^2 - 2 \rightarrow -1 \leq 2u^2 - 2 \leq 1 \rightarrow 1 \leq 2u^2 \rightarrow 1 \leq u^2 \rightarrow u \leq -1 \text{ or } u \geq 1$
 $D_f = [-\sqrt{1}, -1] \cup [1, \sqrt{1}]$ (۱, ۱۵) ✓

ب) $y = \arccos(\sqrt{u-2}) \rightarrow \sqrt{u-2} \leq 1 \rightarrow u-2 \leq 1 \rightarrow u \leq 3$
 $D_f = [2, 3]$ ۴, ۱۴

الف) $y = |u| - 2 \rightarrow -1 \leq |u| - 2 \leq 1 \rightarrow 1 \leq |u| \rightarrow 1 \leq u \leq 3 \text{ or } -3 \leq u \leq -1$
 $D_f = [-3, -1] \cup [1, 3]$ (۱, ۱۵) ✓

ب) $y = \arcsin(u^2 + 2u + 1) \rightarrow -1 \leq u^2 + 2u + 1 \leq 1 \rightarrow \begin{cases} u^2 + 2u + 1 \leq 1 \rightarrow (u+1)^2 \leq 1 \rightarrow -2 \leq u \leq 0 \\ u^2 + 2u + 1 \geq -1 \rightarrow u^2 + 2u + 2 \geq 0 \rightarrow (u+1)^2 + 1 \geq 0 \end{cases}$
 $D_f = [-2, 0] \cup [-1, 1]$ (۱, ۱۵) ✓

الف) $y = \log_{\frac{1}{2}} u^2 - 2 \rightarrow u^2 - 2 > 0 \rightarrow u^2 > 2 \rightarrow u > \sqrt{2} \text{ or } u < -\sqrt{2}$
 $D_f = (\sqrt{2}, +\infty) \cup (-\infty, -\sqrt{2})$ ۵

ب) $y = \log_{\frac{1}{2}} (2 - |u|) \rightarrow 2 - |u| > 0 \rightarrow 2 > |u| \rightarrow -2 < u < 2$
(۱, ۱۵) ✓

الف) $y = \log_{n-2}^{0-n} \rightarrow \begin{cases} 0-n > 0 \rightarrow n < 0 \\ n-2 > 0 \rightarrow n > 2 \\ n-2 \neq 1 \rightarrow n \neq 3 \end{cases} \rightarrow D_f = (3, \infty) - \{3\}$

(1, 1.75)

ب) $y = \log_{n+2}^{n-1} \rightarrow \begin{cases} n-1 > 0 \rightarrow n > 1 \\ n+2 > 0 \rightarrow n > -2 \\ n+2 \neq 1 \rightarrow n \neq -3 \end{cases} \rightarrow D_f = (1, +\infty) - \{-3\}$

الف) $y = \log_{n-2}^{\frac{n^2-2n+2}{n-2}} \rightarrow \frac{n^2-2n+2}{n-2} > 0 \rightarrow \frac{(n-1)(n-1)}{n-2} > 0 \rightarrow D_f = (1, +\infty) - \{3\}$

(2)

ب) $y = \log_{n+2}^{\frac{n+2}{n-2}} \rightarrow \begin{cases} \frac{n+2}{n-2} > 0 \\ n+2 > 0 \\ n+2 \neq 1 \end{cases} \rightarrow \begin{cases} n > -2 \\ n \neq -3 \end{cases} \rightarrow D_f = (-\infty, -3) \cup (-2, +\infty) - \{-3\}$

الف) $y = \sqrt{n - \log_r^{(n-2)}}$ $\rightarrow n - \log_r^{(n-2)} \geq 0 \rightarrow n \geq \log_r^{(n-2)} \rightarrow \begin{cases} n-2 \leq 1 \rightarrow n \leq 3 \\ n-2 > 0 \rightarrow n > 2 \end{cases}$

$D_f = (2, 3]$

(2)

ب) $y = \log_{2 \log_r^n - 1}^{(2 \log_r^n - 1)}$ $\rightarrow \begin{cases} 2 \log_r^n - 1 > 0 \\ 2 \log_r^n - 1 \neq 1 \end{cases} \rightarrow \begin{cases} 2 \log_r^n > 1 \\ 2 \log_r^n \neq 2 \end{cases} \rightarrow \begin{cases} \log_r^n > \frac{1}{2} \\ \log_r^n \neq 1 \end{cases} \rightarrow \begin{cases} n > \frac{1}{2} \\ n \neq 1 \end{cases}$

$D_f = (\frac{1}{2}, +\infty)$

الف) $y = \frac{r}{\varepsilon^{n+1}} \rightarrow \varepsilon^{n+1} \neq 0 \rightarrow \varepsilon^n \neq -1 \rightarrow D_f = \mathbb{R} \setminus \{-1\}$

ع) $y = \frac{r}{\varepsilon^{n-2}} \rightarrow \varepsilon^{n-2} \neq 0 \rightarrow \varepsilon^n \neq 2 \rightarrow n \neq \frac{1}{r} \rightarrow D_f = \mathbb{R} - \{\frac{1}{r}\} \rightarrow D_f = \mathbb{R} - \{\log_r 2\}$

د) $y = \frac{r}{\varepsilon^n - r} \rightarrow \varepsilon^n - r \neq 0 \rightarrow \varepsilon^n \neq r \rightarrow D_f = \mathbb{R} - \{\log_r r\}$

الف) $(\varepsilon n + 1)! \rightarrow \varepsilon n + 1 \in \mathbb{N} \rightarrow \varepsilon n \in \mathbb{N} - 1 \rightarrow n \in \frac{\mathbb{N} - 1}{\varepsilon}$

$D_f = \{n \mid n = \frac{k-1}{\varepsilon}, k \in \mathbb{N}\}$

ب) $y = \left(\frac{r n - 2}{r n - 5}\right)! \rightarrow \frac{r n - 2}{r n - 5} \in \mathbb{N} \rightarrow r n - 2 \in r \mathbb{N} - 5 \rightarrow D_f = \{n \mid n = \frac{r-5k}{r-2k}, k \in \mathbb{N}\}$