



الف)  $\frac{\sin^2 u - 1}{\cos u} \rightarrow \cos u \neq 0 \rightarrow R = \left\{ \frac{\pi}{2} + k\pi \mid k \in \mathbb{Z} \right\}$

ب)  $y = \frac{\cos u}{\cos u - 1} \rightarrow \cos u - 1 \neq 0 \rightarrow \cos u \neq 1 \rightarrow u \neq \pm \frac{\pi}{2} + 2k\pi \rightarrow D = \mathbb{R} - \left\{ \pm \frac{\pi}{2} + 2k\pi \mid k \in \mathbb{Z} \right\}$

الف)  $y = \frac{u+2}{|u+1| - |u+2|} \rightarrow |u+1| \neq |u+2| \rightarrow (u+1)^2 \neq (u+2)^2$   
 $(u+1)^2 - (u+2)^2 = [(u+1) - (u+2)][(u+1) + (u+2)] = (-1)(2u+3) \neq 0$   
 $2u+3 \neq 0 \rightarrow u \neq -\frac{3}{2} \rightarrow R = \left\{ -\frac{3}{2} \right\}$

ب)  $\sqrt{|u+1| - |u+2|} \rightarrow |u+1| \geq |u+2| \rightarrow (u+1)^2 \geq (u+2)^2$   
 $u^2 + 2u + 1 \geq u^2 + 4u + 4 \rightarrow -2u \geq 3 \rightarrow u \leq -\frac{3}{2}$   
 $D_f = (-\infty, -\frac{3}{2}] \cup [\frac{3}{2}, \infty)$

الف)  $\sqrt{\log \log \frac{(u-1)}{u+1}} \rightarrow \log \frac{(u-1)}{u+1} \geq 0 \rightarrow \frac{(u-1)}{u+1} \geq 1 \rightarrow u-1 \geq u+1 \rightarrow -2 \geq 2 \rightarrow \text{no solution}$   
 $\log \frac{(u-1)}{u+1} < 0 \rightarrow \frac{(u-1)}{u+1} < 1 \rightarrow u-1 < u+1 \rightarrow -2 < 2 \rightarrow \text{always true}$   
 $D = \left( \frac{1}{2}, \frac{3}{2} \right)$

الف)  $\log(\cos u + 1) \rightarrow \cos u + 1 > 0 \rightarrow \cos u > -1 \rightarrow u \neq \pi + 2k\pi$   
 $D = \left( -\frac{\pi}{2} + 2k\pi, \frac{\pi}{2} + 2k\pi \right) \rightarrow k \in \mathbb{Z}$

ب)  $\sqrt{\log \frac{u+1}{u-1}} \rightarrow \log \frac{u+1}{u-1} \geq 0 \rightarrow \frac{u+1}{u-1} \geq 1 \rightarrow u+1 \geq u-1 \rightarrow 2 \geq -2 \rightarrow \text{always true}$   
 $\frac{u-1}{u+1} \geq 1 \rightarrow u-1 \geq u+1 \rightarrow -2 \geq 2 \rightarrow \text{no solution}$   
 $D = (-\infty, -1) \cup (1, \infty)$

$$4- \text{ب) } 3 - |n-5| \geq 0 \rightarrow |n-5| \leq 3 \rightarrow -3 \leq n-5 \leq 3 \rightarrow 2 \leq n \leq 8$$

$$\sqrt{3 - |n-5|} - 1 \neq 0 \rightarrow \sqrt{3 - |n-5|} \neq 1 \rightarrow 3 - |n-5| \neq 2 \rightarrow |n-5| \neq 2 \rightarrow n \neq 7, 3$$

$$D_f = [2, 8] - \{3, 7\} = [2, 3) \cup (3, 7) \cup (7, 8]$$

$$9) \log_{\frac{1}{5}} \log_a^{n-1} \rightarrow n-1 > 0 \rightarrow n > \frac{1}{5}$$

$$\log_a^{n-1} > 0 \rightarrow n-1 > 0 \rightarrow n-1 > 1 \rightarrow n > 2$$

$$\log_{\frac{1}{5}} \log_a^{n-1} \geq 0 \xrightarrow[\text{منه!}]{\text{منه!}} \log_a^{n-1} \leq \left(\frac{1}{5}\right)^0 \rightarrow \log_a^{n-1} \leq 1 \rightarrow n-1 \leq 5 \rightarrow n \leq 6 \rightarrow n \leq 3$$

$$\hookrightarrow D_f = (1, 3]$$