

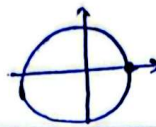
الف) $2\cos x + 1 \neq 0 \Rightarrow 2\cos x \neq -1 \Rightarrow \cos x \neq -\frac{1}{2} \Rightarrow$

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



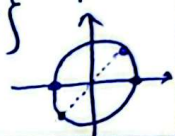
ب) $\cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow$

$D_f = \mathbb{R} - \{2k\pi\}$



الف) $\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1$
 $\tan x = \frac{\sin x}{\cos x} \Rightarrow \cos x \neq 0$

ب) $\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1$
 $\cot x = \frac{\cos x}{\sin x} \Rightarrow \sin x \neq 0$



الف) $-1 \leq \sin y \leq 1 \Rightarrow -1 \leq x^2 - 2 \leq 1 \Rightarrow 1 \leq x^2 \leq 3 \Rightarrow \begin{cases} 1 \leq x \leq \sqrt{3} \\ -1 \geq x \geq -\sqrt{3} \end{cases}$
 $\Rightarrow D_f = [1, \sqrt{3}] \cup [-\sqrt{3}, -1]$

ب) $-1 \leq \sqrt{x} - 2 \leq 1 \Rightarrow 1 \leq \sqrt{x} \leq 3 \Rightarrow 1 \leq x \leq 9 \Rightarrow D_f = [1, 9]$

الف) $-1 \leq \cos y \leq 1 \Rightarrow -1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow \begin{cases} 2 \leq x \leq 4 \\ -2 \geq x \geq -4 \end{cases}$
 $\Rightarrow D_f = [2, 4] \cup [-4, -2]$

ب) $-1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow \begin{cases} x^2 + 3x + 1 \geq -1 \Rightarrow x^2 + 3x + 2 \geq 0 \Rightarrow (x+1)(x+2) \geq 0 \text{ (I)} \\ x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0 \text{ (II)} \end{cases} \Rightarrow$
 $\text{I: } \frac{x+2}{x+1} \geq 1 \quad \text{II: } \frac{x}{x+3} \leq 0 \Rightarrow D_f = \text{I} \cap \text{II} \Rightarrow D_f = [-3, 2] \cup [-2, -1]$

الف) $x^2 - 2 > 0 \Rightarrow x^2 > 2 \Rightarrow \begin{cases} x > \sqrt{2} \\ x < -\sqrt{2} \end{cases} \Rightarrow D_f = (-\infty, -\sqrt{2}) \cup (\sqrt{2}, +\infty)$

ب) $2 - |x| > 0 \Rightarrow |x| < 2 \Rightarrow -2 < x < 2 \Rightarrow D_f = (-2, 2)$

الف) $\left. \begin{matrix} \omega - r > 0 \\ r - r > 0 \\ r - r \neq 1 \end{matrix} \right\} \Rightarrow \begin{cases} r < \omega \\ r > r \\ r \neq r \end{cases} \Rightarrow D_f = (r, \omega) - \{r\}$ ب) $\left. \begin{matrix} r^2 - 1 > 0 \\ r + r > 0 \\ r + r \neq 1 \end{matrix} \right\} \Rightarrow \begin{cases} r > 1 \\ r < -1 \\ r > -r \\ r \neq -r \end{cases} \Rightarrow D_f = (-r, -r) \cup (-r, -1) \cup (1, +\infty)$	6
الف) $\frac{r^2 - 2r + r}{r - r} > 0$. $r^2 - (r + r) = 0 \Rightarrow (r - 1)(r - r) = 0 \Rightarrow \begin{matrix} r = 1 \\ r = r \end{matrix}$ $r - r \neq 0 \Rightarrow r \neq r$ ب) $\left. \begin{matrix} \frac{r + r}{r - r} > 0 \\ r + \omega > 0 \\ r + \omega \neq 1 \end{matrix} \right\} \Rightarrow \begin{cases} r > -\omega \\ r \neq -r \end{cases} \Rightarrow D_f = (-\omega, -r) \cup (-r, -r) \cup (r, +\infty)$	7
الف) $\begin{cases} r - \log_r(r - r) \geq 0 \Rightarrow \log_r(r - r) \leq r \Rightarrow r - r \leq 1 \Rightarrow r \leq 1 \quad \text{I} \\ r - r > 0 \Rightarrow r > r \quad \text{II} \end{cases} \Rightarrow \text{I} \text{ و II} \Rightarrow D_f = (r, 1]$ ب) $\begin{cases} r \log_r^n - 1 > 0 \Rightarrow r \log_r^n > 1 \Rightarrow \log_r^n > \frac{1}{r} \Rightarrow r > r^{\frac{1}{r}} \Rightarrow r > \sqrt[r]{r} \\ r > 0 \end{cases} \Rightarrow D_f = (\sqrt[r]{r}, +\infty)$	8
الف) $r^n + 1 \neq 0 \Rightarrow r^n \neq -1 \Rightarrow D_f = \mathbb{R} - \log_r^{-1}$ ب) $r^n - 1 \neq 0 \Rightarrow r^n \neq 1 \Rightarrow D_f = \mathbb{R} - \log_r^1$ ج) $r^n - r \neq 0 \Rightarrow r^n \neq r \Rightarrow D_f = \mathbb{R} - \log_r^r$ د) $r^n - r \neq 0 \Rightarrow r^n \neq r \Rightarrow D_f = \mathbb{R} - \log_r^r$	9
الف) $rn + 1 \in \mathbb{W} \Rightarrow rn \in \mathbb{W} - 1 \Rightarrow n \in \frac{\mathbb{W} - 1}{r} \Rightarrow D_f = \{n \mid n = \frac{K - 1}{r}, K \in \mathbb{W}\}$ ب) $\frac{rn - r}{rn - \omega} \in \mathbb{W} \Rightarrow rn - r = r\mathbb{W}n - \omega\mathbb{W} \Rightarrow rn - r\mathbb{W}n = r - \omega\mathbb{W} \Rightarrow n(r - r\mathbb{W}) = r - \omega\mathbb{W} \Rightarrow n = \frac{r - \omega\mathbb{W}}{r - r\mathbb{W}} \Rightarrow D_f = \{n \mid n = \frac{r - \omega K}{r - rK}, K \in \mathbb{W}\}$	10