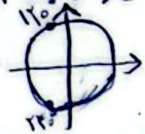
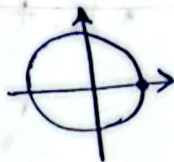


$$2 \cos x + 1 \neq 0 \Rightarrow \cos x \neq -\frac{1}{2} \Rightarrow D_F = \mathbb{R} - \left\{ 2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3} \right\} \quad (\text{الف})$$



$$\cos x - 1 \neq 0 \Rightarrow \cos x \neq 1 \Rightarrow D_F = \mathbb{R} - \{2k\pi\}$$



$$\tan x + 1 \neq 0 \Rightarrow \tan x \neq -1 \Rightarrow D_F = \mathbb{R} - \left\{ k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4} \right\} \quad (\text{الف})$$



$$\cot x - 1 \neq 0 \Rightarrow \cot x \neq 1 \Rightarrow D_F = \mathbb{R} - \left\{ k\pi, k\pi + \frac{\pi}{4} \right\} \quad (\text{ب})$$



$$-1 \leq x^2 - 2 \leq 1 \Rightarrow 1 \leq x^2 \leq 3 \Rightarrow \begin{cases} 1 \leq x \leq \sqrt{3} \\ -\sqrt{3} \leq x \leq -1 \end{cases} \Rightarrow D_F = [-\sqrt{3}, -1] \cup [1, \sqrt{3}] \quad (\text{الف})$$

$$(I). \sqrt{x} \geq 0 \Rightarrow x \geq 0$$

$$(II) 1 \geq \sqrt{x} - 2 \geq -1 \Rightarrow 4 \geq \sqrt{x} \geq 2 \Rightarrow 16 \geq x \geq 4 \Rightarrow D_F = [4, 16] \quad (\text{ب})$$

$$-1 \leq |x| - 3 \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow \begin{cases} 2 \leq x \leq 4 \\ -4 \leq x \leq -2 \end{cases} \quad (\text{الف})$$

$$\begin{aligned} -1 \leq x^2 + 3x + 1 \leq 1 &\Rightarrow \begin{cases} x^2 + 3x + 2 \geq 0 \Rightarrow (x+1)(x+2) \geq 0 & \frac{-2}{+} \frac{-1}{-} \frac{+}{+} \\ x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0 & \frac{-2}{+} \frac{0}{-} \frac{+}{+} \end{cases} \\ &\Rightarrow D_F = [-3, -2] \cup [-1, 0] \end{aligned} \quad (\text{ب})$$

$$x^2 - 4 > 0 \Rightarrow x^2 > 4 \Rightarrow \begin{cases} x > 2 \\ x < -2 \end{cases} \Rightarrow D_F = (-\infty, -2) \cup (2, +\infty) \quad (\text{الف})$$

$$2 - |x| > 0 \Rightarrow 2 > |x| \Rightarrow -2 < x < 2 \Rightarrow D_F = (-2, 2) \quad (\text{ب})$$

$$(I) \omega - x > 0 \Rightarrow \omega > x$$

$$(II) x - 3 > 0 \Rightarrow x > 3 \text{ و } (III) x - 3 \neq 1 \Rightarrow x \neq 4 \Rightarrow D_F = (3, \omega) - \{4\}$$

$$(I) x^2 - 1 > 0 \Rightarrow x^2 > 1 \Rightarrow x > 1 \text{ و } x < -1$$

$$(II) x + 3 > 0 \Rightarrow x > -3 \text{ و } x + 3 \neq 1 \Rightarrow x \neq -2 \Rightarrow D_F = (-3, -2) \cup (-2, -1) \cup (1, +\infty)$$

$$\frac{(x-3)(x-1)}{x-3} > 0 \Rightarrow \frac{1}{-1} + \frac{3}{x-3} > 0 \Rightarrow$$

$$D_F = (1, 3) \cup (3, +\infty) \cup (1, +\infty) - \{3\}$$

$$\frac{x+3}{x-1} > 0 \Rightarrow \frac{-3}{1} + \frac{3}{x-1} > 0 \text{ و } x + \omega > 0 \Rightarrow x > -\omega \text{ و } x + \omega \neq 1 \Rightarrow x \neq -\omega \Rightarrow$$

$$D_F = (-\omega, -\omega) \cup (-\omega, -3) \cup (2, +\infty)$$

$$\log_r(x-2) \Rightarrow x-2 > 0 \Rightarrow x > 2, 3 - \log_r(x-2) \geq 0 \Rightarrow$$

$$3 \geq \log_r(x-2) \Rightarrow x-2 \leq 8 \Rightarrow x \leq 10 \Rightarrow D_F = (2, 10]$$

$$x > 0 \text{ و } 2 \log_r x - 1 > 0 \Rightarrow 2 \log_r x > 1 \Rightarrow \log_r x > \frac{1}{2} \Rightarrow x > \sqrt{r} \Rightarrow \frac{1}{r}$$

$$\Rightarrow D_F = (\sqrt{r}, +\infty)$$

$$r^x + 1 \neq 0 \Rightarrow r^x \neq -1 \Rightarrow D_F = \mathbb{R}$$

$$r^x - 1 \neq 0 \Rightarrow r^x \neq 1 \Rightarrow r^{2x} \neq 1 \Rightarrow x \neq 0 \Rightarrow D_F = \mathbb{R} - \{0\}$$

$$r^x - 2 \neq 0 \Rightarrow r^x \neq 2 \Rightarrow r^{2x} \neq 2 \Rightarrow 2x \neq 1 \Rightarrow x \neq \frac{1}{2} \Rightarrow D_F = \mathbb{R} - \{\frac{1}{2}\}$$

$$r^x - r \neq 0 \Rightarrow r^x \neq r \Rightarrow x \neq \log_r r \Rightarrow D_F = \mathbb{R} - \{\log_r r\}$$

$$r \cdot x + 1 \in \mathbb{W} \Rightarrow r \cdot x \in \mathbb{W} - 1 \Rightarrow x \in \frac{\mathbb{W} - 1}{r} \Rightarrow$$

$$D_F = \left\{ x \mid x = \frac{k-1}{r} \text{ و } k \in \mathbb{W} \right\}$$

$$\frac{r \cdot x - r}{r \cdot x - \omega} \in \mathbb{W} \Rightarrow r \cdot x - r \in r \cdot x \mathbb{W} - \omega \mathbb{W} \Rightarrow r \cdot x - r \cdot x \mathbb{W} \in r - \omega \mathbb{W}$$

$$\Rightarrow x(r - r \mathbb{W}) \in r - \omega \mathbb{W} \Rightarrow x \in \frac{r - \omega \mathbb{W}}{r - r \mathbb{W}} \Rightarrow$$

$$D_F = \left\{ x \mid x = \frac{r - \omega k}{r - r k} \text{ و } k \in \mathbb{W} \right\}$$