

الف $2 \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{2}$

$D_f: \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$

ب) $\cos x \geq 1 \rightarrow \cos x = 1$

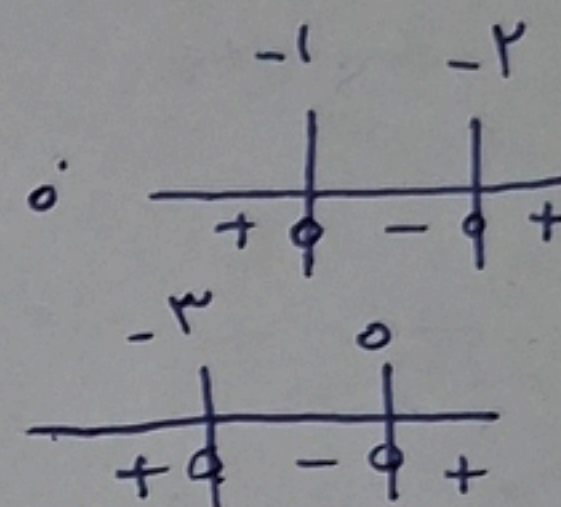
$D_f: 2k\pi$

$-1 \leq \cos \leq 1$

الف $-1 \leq |x-3| \leq 1 \rightarrow 2 \leq |x| \leq 4 \rightarrow |x| \leq 4, |x| \geq 2$

$D_f: [-4, -2] \cup [2, 4]$

ب) $\begin{cases} x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+2)(x+1) \geq 0 \\ x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0 \end{cases}$



$[-3, -2] \cup [-1, 0]$

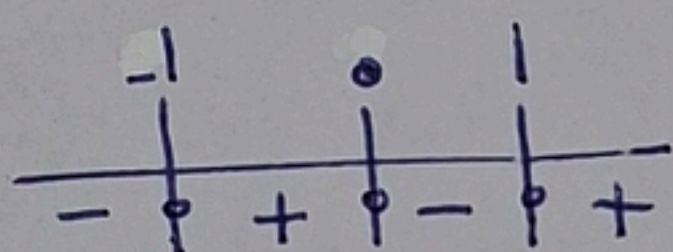
الف $\begin{cases} x > 2 \\ \log_3(x-2) \leq 2 \end{cases}$

$\log_3(x-2) \leq 2 \rightarrow x-2 \leq 9 \rightarrow x \leq 11$

$D_f: 2 < x \leq 11 : (2, 11]$

ب) $x^3 - x > 0$

$x(x-1)(x+1) > 0$



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

الف $e^x + 1 \neq 0 \rightarrow e^x \neq -1 \rightarrow D_f: \mathbb{R}$

ب) $e^x \neq 1 \rightarrow x \neq \log_e 1 \rightarrow D_f: \mathbb{R} - \{ \log_e 1 \}$

ج) $e^x \neq 2 \rightarrow x \neq \log_e 2 \Rightarrow x \neq \frac{1}{2} \rightarrow D_f: \mathbb{R} - \{ \frac{1}{2} \}$

د) $e^x \neq 3 \rightarrow x \neq \log_e 3 \rightarrow D_f: \mathbb{R} - \{ \log_e 3 \}$

الف $f(x+1) \in \mathbb{W} \rightarrow x \in \frac{\mathbb{W}-1}{f}$

$D_f: \{ x | x = \frac{k-1}{f}, k \in \mathbb{W} \}$

ب) $3x-2 \in \mathbb{W} \rightarrow 3x-2 = \omega \rightarrow 3x = \omega+2 \rightarrow x = \frac{\omega+2}{3}$

$x = \frac{\omega+2}{3}$

$D_f: \{ x | x = \frac{\omega k - 2}{3k - 3}, k \in \mathbb{W} \}$