

الف) $x^3 - x > 0$ $x^3 - 4x \geq 0$ $x(x^2 - 1) > 0$ $x(x^2 - 4) \geq 0$
 $x = 0$ $x = \pm 1$ $x = 0$ $x = 4$
 $D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$

ب) $x^3 - x > 0$ $x^3 - x^3 \geq 0$ $x(x^2 - 1) > 0$ $x^3(x^2 - 1) \geq 0$
 $x = 0$ $x = \pm 1$ $x = 0$ $x = \pm 1$
 $D_f = \{1, 2, -1, 0\}$

الف) $x + |x| > 0$ $x > 0 \Rightarrow x + |x| = 2x > 0$
 $x < 0 \Rightarrow x + |x| = 0$
 $D_f = (0, +\infty)$

ب) $x|x| > 0$ $D_f = (0, +\infty)$

الف) $2 - [x] \geq 0$ $2 \geq [x]$ $D_f = (-\infty, 3)$

ب) $2 - [x] > 0$ $2 > [x]$ $D_f = (\infty, 2)$

الف) $[x + \frac{1}{3}] - 1 + [x + \frac{1}{3}] \geq 0 \rightarrow 2[x + \frac{1}{3}] \geq 1 \rightarrow [x + \frac{1}{3}] \geq \frac{1}{2}$
 $x + \frac{1}{3} \geq 1$ $x \geq \frac{2}{3}$ $[\frac{2}{3}, +\infty)$

ب) $\sqrt{[x - \frac{1}{3}] + [-(x - \frac{1}{3})]} \geq 0$ $x - \frac{1}{3} \in \mathbb{Z}$
 $D_f = \{x | x = k - \frac{1}{3}, k \in \mathbb{Z}\}$

الف) $\sin x - 1 \neq 0$ $\sin x \neq 1$ $D_f = \mathbb{R} - \{1, x + \frac{\pi}{2}\}$

ب) $\sqrt{\sin^2 x - 1} \neq 0$ $\sin^2 x \neq \frac{1}{4}$
 $\sin x \neq \pm \frac{\sqrt{1}}{\sqrt{2} \sqrt{2}} = \frac{\sqrt{2}}{2}$
 $D_f = \mathbb{R} - \{k\pi + \frac{\pi}{4}, k\pi - \frac{\pi}{4}\}$

الف) $2 \sin x - 1 \geq 0$ $\sin x \geq \frac{1}{2}$ $D_f = \left\{ 2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right\}$	ب) $\cos x \geq 1$ $D_f = \{2k\pi\}$	٦
الف) $-1 \leq x - 3 \leq 1$ $2 \leq x \leq 4$ $2 \leq x \leq 4$ $-2 \geq x \geq -4$ $D_f = [-4, -2] \cup [2, 4]$	ب) $-1 \leq x^2 + 3x + 1 \leq 1$ $x^2 + 3x + 1 \geq 0$ $x^2 + 3x \leq 0$ $x(x+3) \leq 0$ $x=0 \quad x=-3$ $x^2 + 3x + 1 \geq 0$ $x^2 + 3x + 1 \leq 0$ $x^2 + 3x + 1 = 0$ $x = \frac{-3 \pm \sqrt{9-4}}{2} = \frac{-3 \pm \sqrt{5}}{2}$ $D_f = \left[\frac{-3-\sqrt{5}}{2}, \frac{-3+\sqrt{5}}{2} \right] \cup \left[\frac{-3+\sqrt{5}}{2}, \frac{-3-\sqrt{5}}{2} \right]$	٧
الف) $2 - \log_3(x-2) \geq 0$ $2 \geq \log_3(x-2)$ $9 \geq (x-2)$ $11 \geq x$ $D_f = (2, 11]$	ب) $x^3 - x > 0$ $x(x^2 - 1) > 0$ $x=0 \quad x=\pm 1$ $D_f = (-1, 0) \cup (1, +\infty)$	٨
الف) $f^x + 1 \neq 0$ $f^x \neq -1$ $D_f = \mathbb{R}$	ب) $f^x \neq 1$ $x \neq 0$ $D_f = \mathbb{R} - \{0\}$	٩
الف) $f^x + 1 \in \mathbb{W}$ $f^x \in \mathbb{W} - 1$ $x \in \frac{\mathbb{W}-1}{\varepsilon}$ $D_f = \left\{ x \mid x = \frac{k-1}{\varepsilon}, k \in \mathbb{W} \right\}$	ب) $D_f = \left\{ x \mid x = \frac{-\Delta k + \gamma}{-\gamma \mathbb{W} + \gamma}, k \in \mathbb{W} \right\}$	١٠