

الف) $\frac{x(x-4)}{x(x-1)(x+1)} \geq 0$ $\frac{-1}{-1} \frac{0}{0} \frac{1}{1} \frac{4}{4}$ $D_f = (-1, 0) \cup (0, 1) \cup [4, +\infty)$

ب) $\frac{x^3(x-1)(x+1)}{x(x-1)(x+1)} \geq 0$ $\frac{-1}{+1} \frac{0}{0} \frac{1}{1}$ $D_f = \mathbb{R} - \{-1, 0, 1\}$

الف) $x + |x| \geq 0$ $D_f = \mathbb{R}^+$ $\frac{0}{x} \frac{+}{\checkmark} \frac{-}{x}$ $D_f = (0, +\infty)$

ب) $x|x| \geq 0$ $D_f = \mathbb{R}^+$ $\frac{0}{x} \frac{+}{\checkmark} \frac{-}{x}$ $D_f = (0, +\infty)$

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

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

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

ب) $\begin{cases} a \in \mathbb{Z} & [a] + [-a] = 0 \\ a \notin \mathbb{Z} & [a] + [-a] = -1 \end{cases}$

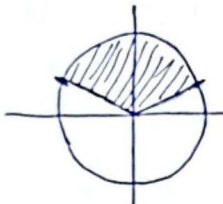
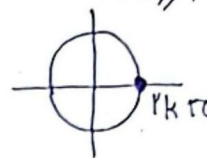
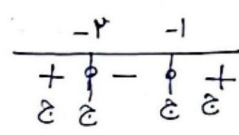
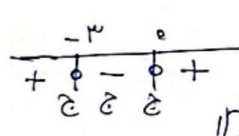
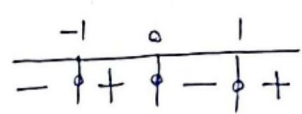
$\Rightarrow [x - \frac{1}{3}] + [-(x - \frac{1}{3})]$

$\Rightarrow x - \frac{1}{3} \in \mathbb{Z} \Rightarrow x \in \mathbb{Z} + \frac{1}{3}$

$D_f = \{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$

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

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

الف) $2 \sin x - 1 \geq 0$ $2 \sin x \geq 1$ $\sin x \geq \frac{1}{2}$ 	ب) $\cos x - 1 \geq 0$ $\cos x \geq 1 \Rightarrow \cos x = 1$ 	۶
الف) $-1 \leq x - 3 \leq 1$ $2 \leq x \leq 4$	$\left. \begin{array}{l} 2 \leq x \leq 4 \\ -4 \leq x \leq -2 \end{array} \right\} \Rightarrow D_f = [-4, -2] \cup [2, 4]$ ب) $x^2 + 3x + 1 \geq -1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0$  $x^2 + 3x + 1 \leq 1 \rightarrow x(x+3) \leq 0$  $D_f = [-3, -2] \cup [-1, 0]$	۷
الف) $2 - \log_3(x-2) \geq 0$ $\log_3(x-2) \leq 2$	$\left. \begin{array}{l} x-2 \leq 9 \\ x \leq 11 \end{array} \right\} \text{ و } \left. \begin{array}{l} x-2 > 0 \\ x > 2 \end{array} \right\} \Rightarrow D_f = (2, 11]$ ب) $x^3 - x > 0$ $x(x-1)(x+1) > 0$  $D_f = (-1, 0) \cup (1, +\infty)$	۸
الف) $4^x + 1 \neq 0$ $4^x \neq -1$ (همواره برقرار است) $\Rightarrow D_f = \mathbb{R}$	ب) $4^x - 1 \neq 0$ $4^x \neq 1$ $x \neq 0$ ج) $4^x - 2 \neq 0$ $4^x \neq 2$ $\log_4 2 \neq x$ د) $4^x - 3 \neq 0$ $4^x \neq 3$ $\log_4 3 \neq x$ $D_f = \mathbb{R} - \{0\}$ $D_f = \mathbb{R} - \{\log_4 2\}$ $D_f = \mathbb{R} - \{\log_4 3\}$	۹
الف) $fx + 1 \in \mathbb{W} \Rightarrow fx \in \mathbb{W} - 1 \Rightarrow x \in \frac{\mathbb{W}-1}{f}$ ب) $\frac{3x-2}{2x-5} \in \mathbb{W}$ $x = -\frac{-5\mathbb{W}+2}{2\mathbb{W}-3} \rightarrow x = \frac{5k-2}{2k-3} \Rightarrow D_f = \{x \mid x = \frac{5k-2}{2k-3}, k \in \mathbb{W}\}$	$\Rightarrow D_f = \{x \mid x = \frac{k-1}{f}, k \in \mathbb{W}\}$ $D_f = \{x \mid x = \frac{5k-2}{2k-3}, k \in \mathbb{W}\}$	۱۰