

الف) $\frac{x(x-6)}{x(x+1)(x-1)} \geq 0 \Rightarrow \frac{-1}{\frac{1}{x} + \frac{1}{x+1} + \frac{1}{x-1}} \geq 0 \Rightarrow \frac{-1}{\frac{1}{x^2-1} + \frac{1}{x}} \geq 0$
 $\Rightarrow x(x+1)(x-1) \neq 0 \Rightarrow \mathbb{R} \setminus \{-1, 0, 1\}$

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

الف) $x + |x| \geq 0 \Rightarrow |x| \geq -x \Rightarrow D = \mathbb{R}^+$

ب) $x|x| > 0 \Rightarrow D = \mathbb{R}^+$

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

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

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

ب) $\{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$
 $x - \frac{1}{3} \in \mathbb{Z} \Rightarrow D = \{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$

الف) $\sin x - 1 \neq 0 \Rightarrow \sin x \neq 1 \Rightarrow D = \mathbb{R} \setminus \{x \mid x = 2k\pi + \frac{\pi}{2}, k \in \mathbb{Z}\}$

ب) $\sqrt[3]{\sin x} - 1 \neq 0 \Rightarrow \sqrt[3]{\sin x} \neq 1 \Rightarrow \sin x \neq 1 \Rightarrow D = \mathbb{R} \setminus \{x \mid x = 2k\pi + \frac{\pi}{2}, k \in \mathbb{Z}\}$

الف) $2 \sin x - 1 \geq 0 \Rightarrow \sin x \geq \frac{1}{2} \Rightarrow [2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6}]$

ب) $\cos x - 1 \geq 0 \Rightarrow \cos x \geq 1 \Rightarrow [2k\pi]$
 زیرا $|\cos x| \leq 1$ است و $\cos x = 1$ فقط در $x = 2k\pi$

الف) $-1 \leq |x| \leq 1 \Rightarrow 2 \leq |x| \leq 4 \Rightarrow x \in [2, 4] \cup [-4, -2]$
 $-1 \leq x^2 + 3x + 1 \leq 1 \Rightarrow I = \{x \mid x^2 + 3x + 2 \geq 0\} \Rightarrow x \leq -2 \text{ یا } x \geq -1$

ب) $II = \{x \mid x^2 + 3x \leq 0\} \Rightarrow -3 \leq x \leq 0$
 $I \cup II = D = [-3, -2] \cup [-1, 0]$

الف) $2 - \log_p x \geq 0 \Rightarrow \log_p x \leq 2 \Rightarrow x \leq p^2 \Rightarrow (I) x \leq 11$

ب) $(II) x > 2 \Rightarrow D = \{x \mid 2 < x \leq 11\}$

ب) $x^3 - x > 0 \Rightarrow x(x+1)(x-1) > 0 \Rightarrow (-1, 0) \cup (1, +\infty)$

الف) $e^x \neq -1 \Rightarrow D = \mathbb{R}$

ب) $e^x \neq 2 \Rightarrow D = \mathbb{R} \setminus \{\log_e 2\}$

ب) $e^x \neq 1 \Rightarrow D = \mathbb{R} \setminus \{0\}$

الف) $e^x + 1 < w \Rightarrow x \in \frac{w+1}{e}$

ب) $x = \frac{2wx - \Delta w + 1}{2} \Rightarrow D = \{x \mid x = \frac{2k+1}{2}, k \in \mathbb{Z}\}$

الف) $2a - 2aw \in \mathbb{Z} \Rightarrow a(2 - 2w) \in \mathbb{Z}$

ب) $a \in \frac{\mathbb{Z} - \Delta w}{2 - 2w} \Rightarrow D_y = \{a \mid a = \frac{2 - \Delta w}{2 - 2w}, w \in \mathbb{Z}\}$