



الف) $(x-1)(x-2) \geq 0 \Rightarrow x \leq 1 \text{ or } x \geq 2 \Rightarrow (-\infty, 1] \cup [2, +\infty) = D_f$

ب) $(x-1)(x-2) < 0 \Rightarrow 1 < x < 2 \Rightarrow (1, 2) = D_f$

ج) $(x+1)(x+2) \geq 0 \Rightarrow x \leq -1 \text{ or } x \geq -2 \Rightarrow (-\infty, -1] \cup [-2, +\infty) = D_f$

د) $(x-1)(x-2) \leq 0 \Rightarrow 1 \leq x \leq 2 \Rightarrow [1, 2] = D_f$

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

ب) $\frac{(x+1)(x-1)}{(x-1)(x-2)} \geq 0 \Rightarrow \frac{1}{-1} \leq \frac{x-1}{x-2} \leq \frac{1}{-2} \Rightarrow (-\infty, 1] \cup (2, +\infty) = D_f$

الف) $\frac{x^2-1}{x^2-x} \geq 0 \Rightarrow \frac{x-1}{x} \geq 0 \Rightarrow \frac{1}{-1} \leq \frac{x-1}{x} \leq \frac{1}{-0} \Rightarrow (-\infty, 0) \cup (1, +\infty) = D_f$

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الف) $\begin{cases} x-x \geq 0 \Rightarrow x \leq x \rightarrow (-\infty, x] \\ x-\sqrt{x-x} \geq 0 \Rightarrow \sqrt{x-x} \leq x \Rightarrow x \leq x \Rightarrow (-\infty, x] \end{cases} \Rightarrow (-\infty, x]$

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$$\star) 4 - x^2 \geq 0 \Rightarrow x^2 \leq 4 \Rightarrow x^2 \leq 2 \Rightarrow \begin{cases} x \leq \sqrt{2} \\ x \geq -\sqrt{2} \end{cases} \Rightarrow [-\sqrt{2}, \sqrt{2}] = D_f$$

$$\text{ب) } 3|x| - 9 \geq 0 \Rightarrow |x| \geq 3 \Rightarrow \begin{cases} x \geq 3 \\ x \leq -3 \end{cases} \Rightarrow (-\infty, -3] \cup [3, +\infty) = D_f$$

$$\text{الف) } \frac{|x| - 3}{x} \neq 0 \Rightarrow |x| \neq 3 \Rightarrow D_f = \mathbb{R} - \{\pm 3\}$$

$$\text{ب) } \frac{\sqrt{x} - 3}{x} \neq 0 \Rightarrow \sqrt{x} \neq 3 \Rightarrow x \neq 9 \Rightarrow [0, +\infty) - \{9\} = D_f$$

$$\text{الف) } \rightarrow \cos x \neq \frac{1}{2} \xrightarrow{D_f} \mathbb{R} - \{2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}\} \rightarrow$$

$$\text{ب) } \rightarrow \sin x \neq -\frac{1}{2} \xrightarrow{D_f} \mathbb{R} - \{2k\pi + \frac{7\pi}{6}, 2k\pi + \frac{11\pi}{6}\} \rightarrow$$

$$\text{ج) } \rightarrow \frac{\frac{\sin x}{\cos x} + 2}{\frac{\cos x}{\sin x} - 1} \Rightarrow \begin{cases} \cos x \neq 0 \\ \sin x \neq 0 \\ \cot x \neq 1 \end{cases} \xrightarrow{D_f} \mathbb{R} - \{k\pi, k\pi + \frac{\pi}{4}\}$$

$$\text{د) } \rightarrow \sin^2 x \neq \frac{3}{4} \Rightarrow \sin x \neq \pm \frac{\sqrt{3}}{2} \xrightarrow{D_f} \mathbb{R} - \{k\pi + \frac{\pi}{3}, k\pi + \frac{2\pi}{3}\}$$

$$\Rightarrow 2|x-2| - \frac{1}{x} > 0 \Rightarrow |x-2| > \frac{1}{x} \Rightarrow |x-2| > \frac{1}{x} \Rightarrow \begin{cases} x-2 > \frac{1}{x} \Rightarrow x > \frac{9}{x} \\ x-2 < -\frac{1}{x} \Rightarrow x < \frac{9}{x} \end{cases}$$

$$\Rightarrow D_f = (-\infty, \frac{9}{x}) \cup (\frac{9}{x}, +\infty)$$

$$\text{الف) } 2 - |x| \geq 0 \Rightarrow |x| \leq 2 \Rightarrow \begin{cases} x \leq 2 \\ x \geq -2 \end{cases} \xrightarrow{D_f} [-2, 2]$$

$$\text{ب) } \left\{ \begin{array}{l} \frac{|x|}{|x|} \geq 0 \rightarrow \text{بدلیل قدر مطلق درست است} \\ x \neq 0 \end{array} \right\} \Rightarrow D_f = \mathbb{R} - \{0\}$$