

الف) $\frac{x+3}{(x-1)(2x^2+3x-3)} \quad x=1R \quad (x-1)(2x^2+3x-3) \neq 0 \quad x \neq 1$
 $2x^2+3x-3 \neq 0 \quad (x+3)(2x-1) \neq 0 \quad x \neq -3 \quad x \neq \frac{1}{2} \quad D = 1R - \left\{1, -3, \frac{1}{2}\right\}$

ب) $\frac{x+3}{(x+1)(2x^2+7x+3)} \quad x=1R \quad (x+1)(2x^2+7x+3) \neq 0 \quad x \neq -1$
 $2x^2+7x+3 \neq 0 \quad (x+3)(2x+1) \neq 0 \quad x \neq -3 \quad x \neq -\frac{1}{2} \quad D = 1R - \left\{-1, -3, -\frac{1}{2}\right\}$

الف) $\frac{x+3}{(x-1)(x^2-x+1)} \quad x=1R \quad (x-1)(x^2-x+1) \neq 0 \quad x \neq 1$
 $x^2-x+1 \neq 0$ به ازای مقادیر حقیقی x $D = 1R - \{1\}$

ب) $\frac{x+3}{x^3-2x^2+2x-1} \geq 0 \quad \frac{x+3}{(x-1)(x^2-x+1)} \geq 0 \quad x = -3 \quad x = 1 \quad x^2-x+1 = 0$ ریشه ندارد
 $\begin{array}{c|ccc} -\infty & -3 & 1 & +\infty \\ \hline & + & - & + \end{array} \quad D = (-\infty, -3] \cup (1, +\infty)$

الف) $|2x+1| - |x+3| \neq 0 \quad |2x+1| \neq |x+3| \quad (2x+1)^2 \neq (x+3)^2$
 $4x^2+4x+1 \neq x^2+6x+9 \quad 3x^2-2x-8 \neq 0 \quad (x-2)(3x+4) \neq 0$
 $x \neq 2 \quad x \neq -\frac{4}{3} \quad D = 1R - \left\{2, -\frac{4}{3}\right\}$
 ب) $|2x+1| - |x+3| \geq 0 \quad |2x+1| \geq |x+3| \quad (2x+1)^2 \geq (x+3)^2 \quad 4x^2+4x+1 \geq x^2+6x+9$
 $3x^2-2x-8 \geq 0 \quad (x-2)(3x+4) \geq 0 \quad x = 2 \quad x = -\frac{4}{3}$
 $\begin{array}{c|ccc} -\infty & -\frac{4}{3} & 2 & +\infty \\ \hline & + & - & + \end{array} \quad D = (-\infty, -\frac{4}{3}] \cup [2, +\infty)$

الف) $x > 0 \quad 1 - \log_{\frac{x}{4}} > 0 \quad \log_{\frac{x}{4}} < 1 \quad x < 4 \quad D = (0, 4)$

ب) $x > 0 \quad 1 - \log_{\frac{x}{4}} > 0 \quad \log_{\frac{x}{4}} < 1 \quad x < \frac{1}{4} \quad D = (0, \frac{1}{4})$

$$2x-1 > 0 \quad 2x > 1 \quad x > \frac{1}{2}$$

$$\log_{\frac{1}{2}} (2x-1) > 0 \quad 2x-1 > 1 \quad 2x > 2 \quad x > 1$$

$$\log_{\frac{1}{2}} (\log_{\frac{1}{2}} (2x-1)) > 0 \quad \log_{\frac{1}{2}} (2x-1) > 1 \quad 2x-1 > 2 \quad 2x > 3 \quad x > \frac{3}{2}$$

$$D = (\frac{3}{2}, +\infty)$$

الف) $2 \cos x + 1 > 0 \quad \cos x > -\frac{1}{2} \quad D = (-\frac{\sqrt{3}}{2} + 2K\pi, \frac{\sqrt{3}}{2} + 2K\pi)$

$$\Rightarrow \frac{x-1}{x+1} > 0 \rightarrow \mathbb{R} - \{0, -1\} \quad \wedge \rightarrow D = [2, +\infty)$$

$$\log \frac{x-1}{x+1} \geq 0 \rightarrow x-1 \geq 1 \quad x \geq 2$$

$$(a+2)x^2 + ax + b \geq 0$$

$$x=2 \rightarrow (a+2)(4) + 2a + b \geq 0 \rightarrow 4a + b \geq -8$$

$$x=1 \rightarrow (a+2)(1) + a + b \geq 0 \rightarrow 2a + b \geq -2$$

$$\begin{cases} 4a + b \geq -8 \\ 2a + b \geq -2 \end{cases} \quad \begin{cases} 4a + b \geq -8 \\ 2a - 2b \geq +10 \end{cases} \quad \begin{matrix} -b \geq -2 \\ \boxed{b \leq 2} \end{matrix}$$

$$x^2 + 2x + 1 - m^2 \geq 0 \quad (x+1)^2 + 1 - m^2 \geq 0 \rightarrow$$

$$m^2 - 1 \leq 0 \quad |m| \leq 1 \quad -1 \leq m \leq 1$$

$$\text{جواب} = 2$$

$$x - x^2 \geq 0 \quad x \leq 1 \quad -1 \leq x \leq 1$$

$$[x] + [-x] + 1 \neq 0$$

$$[x] + [-x] \neq -1$$

$$x = \text{عدد صحيح}$$

$$D = [-1, 1]$$

$$\left\{ \begin{matrix} x \in \mathbb{Q} \\ x \in \mathbb{Z} \end{matrix} \right\}$$