

$$1) \quad 2x^3 + 3x^2 - 11x + 4 \neq 0 \rightarrow (x-1)(x+2)(2x-1) \quad (1)$$

$$2x^3 + 3x^2 - 11x + 4 = 0 \rightarrow \text{نویسند } x-1 \rightarrow x \neq 1, -2, \frac{1}{2}$$

$$D_f = \mathbb{R} - \left\{1, -2, \frac{1}{2}\right\}$$

$$2) \quad 2x^3 + 9x^2 + 11x + 3 \neq 0 \rightarrow (x+1)(2x+1)(x+3)$$

$$x \neq -\frac{1}{2}, -1, -3 \rightarrow D_f = \mathbb{R} - \left\{-\frac{1}{2}, -1, -3\right\}$$

$$3) \quad x^2 - 2x + 2x - 1 = (x-1)(x^2 - x + 1) \quad D_f = \mathbb{R} - \{1\} \quad (2)$$

$\Delta < 0$
همیشه مثبت

$$4) \quad \frac{x+3}{(x-1)(x^2-x+1)} \geq 0$$

$\Delta < 0$
 $x^2 - x + 1 > 0$
همیشه مثبت

$$\frac{x+3}{x-1} \geq 0 \rightarrow D_f = [-\infty, -3] \cup (1, +\infty)$$

$$x^2 - \Delta(x-1) - 2x + \Delta \neq 0 \quad \Delta > 1 \quad \text{حالت اول}$$

$$x^2 - \Delta(x-1) - 2x + \Delta = x^2 - \Delta x + 1$$

$$(x-2)(x-\Delta) \rightarrow x \neq 2, x \neq \Delta$$

$$|x-1| = 1-x \rightarrow x^2 - \Delta(1-x) - 2x + \Delta = x^2 + x$$

$$= x(x+1) \rightarrow x \neq 0, x \neq -1$$

$$D_f = (-\infty, -3] \cup (-3, 0) \cup (0, 1) \cup [1, 2) \cup (2, \Delta) \cup (\Delta, +\infty)$$

$x < 1$ حالت دوم

$$الف) \sqrt{[-x]^2} - [-x] - 2 \geq 0 \quad [-x] \geq 2$$

$$-x \geq 2 \rightarrow \boxed{x \leq -2}$$

$$ب) [-x]^2 - 2[-x] - 3 \neq 0 \rightarrow [-x] = t \rightarrow t^2 - 2t - 3 = 0$$

$$(t-3)(t+1) = 0 \rightarrow t \neq -1$$

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

$$-2 \leq x \leq -1$$

$$(-\infty, -2) \cup (-1, 3), [3, +\infty)$$

$$[-x] \neq 3 \rightarrow -3 \leq x \leq 3$$

$$الف) \left[x - \frac{1}{p}\right] + \left[x + \frac{p}{p}\right] \geq 0 = p \left[x - \frac{1}{p}\right] + 1 \rightarrow p \left[x - \frac{1}{p}\right] + 1 \geq 0$$

$$\left[x - \frac{1}{p}\right] \geq 0 \rightarrow x - \frac{1}{p} \geq 0 \rightarrow D_p = \left[\frac{1}{p}, \infty\right)$$

معاملات

$$ب) \left[x - \frac{1}{p}\right] + \left[\frac{1}{p} - x\right] = 2 = x - \frac{1}{p} \rightarrow [t] + [-t] = 1 \quad \begin{matrix} t \in \mathbb{Z} \\ t \notin \mathbb{Z} \end{matrix}$$

$$x - \frac{1}{p} \in \mathbb{Z} \rightarrow D_p = \left\{ \frac{1}{p} + n \mid n \in \mathbb{Z} \right\}$$

$$الف) \sin x \neq 0 \quad \cos x \neq 0 \quad \tan x \neq 1 \quad \tan x \neq -1$$

$$x \neq k\pi, x \neq \frac{\pi}{2} + k\pi, x \neq -\frac{\pi}{2} + k\pi$$

$$ب) 1 - \sin^2 x \geq 0 \quad \sin^2 x \leq \frac{1}{2} \quad \sin x \leq \frac{1}{\sqrt{2}} \quad D = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$$

الف) $r \sin x - 1 \geq 0 \rightarrow r \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{r}$ (✓)

$\bigoplus_{D_f} [k\pi + \frac{\pi}{4}, k\pi + \frac{3\pi}{4}]$

ب) $1 - r \cos x \geq 0 \rightarrow 1 \geq r \cos x \rightarrow \frac{1}{r} \geq \cos x$ $D_f = [k\pi + \frac{\pi}{r}, k\pi + \frac{2\pi}{r}]$
 $[k\pi - \frac{\pi}{r}, k\pi - \frac{\pi}{r}]$

الف) $-1 \leq x^2 + 3x + 1 \leq 1$ $-2 \leq x^2 + 3x \leq 0$ (✓)

$x(x+3) \leq 0 \rightarrow -3 \leq x \leq 0$

$x^2 + 3x + 2 \geq 0$ $(x+1)(x+2) \geq 0 \rightarrow x \leq -2, x \geq -1$

$D_f = [-3, -2] \cup [-1, 0]$

ب) $2 - 2x \geq 0 \rightarrow x \leq \frac{2}{2}$

الف) $\log_r (1 - \log_3 x)$ $x > 0$ $1 - \log_3 x \geq 0$ (✓)

$\log_3 x < 1 \rightarrow x < 3 \rightarrow D_f = (0, 3)$

ب) $\log_r (1 - \log_{\frac{1}{r}} x)$ $\log_{\frac{1}{r}} x < 1$ $x > (\frac{1}{r})^1$ $D = (\frac{1}{r}, +\infty)$

$$\text{ان } r^{\frac{\epsilon}{1-\epsilon}} - \lambda > 0 \rightarrow r^{\epsilon x - x^2} \geq 1$$

$$\frac{\epsilon}{1-\epsilon}$$

$$\epsilon x - x^2 \geq 1$$

$$x(\epsilon - x) > 0$$

$$D_f = (-\infty, 0) \cup (\epsilon, +\infty) \quad (1)$$

$$\text{ب) } D_f = \left\{ \frac{a - \epsilon n}{r_{n-r}} \mid n \in \mathbb{Z}_{\geq 0} \right\}$$