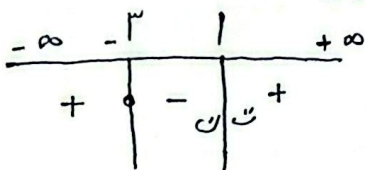


۱۹۷۵ آفرین عالی نوشتی

الف) $2x^3 + 3x^2 - 8x + 3 \neq 0 \Rightarrow (x-1)(2x-1)(x+3) \neq 0 \Rightarrow D_f = \mathbb{R} - \left\{1, \frac{1}{2}, -3\right\}$

ب) $2x^3 + 9x^2 + 10x + 3 \neq 0 \Rightarrow (x+1)(2x+1)(x+3) \neq 0 \Rightarrow D_f = \mathbb{R} - \left\{-1, -\frac{1}{2}, -3\right\}$ پ

الف) $x^3 - 2x^2 + 2x - 1 \neq 0 \Rightarrow (x-1)(x^2 - x + 1) \neq 0 \Rightarrow D_f = \mathbb{R} - \{1\}$
 ریشه حقیقی، $\Delta < 0$ ندارد

ب) $y = \sqrt{\frac{x+3}{x^2 - 2x^2 + 2x - 1}}$  $\Rightarrow D_f = (-\infty, -3] \cup (1, +\infty)$ پ

$x^2 - 5|x-1| - 2x + 5 \neq 0 \begin{cases} x^2 - 5x + 5 - 2x + 5 \neq 0 & (1) \\ x^2 + 5x - 5 - 2x + 5 \neq 0 & (2) \end{cases}$

(1): $x^2 - 7x + 10 \neq 0 \Rightarrow (x-5)(x-2) \neq 0 \Rightarrow x \neq 2, 5$

(2): $x^2 + 3x \neq 0 \Rightarrow x(x+3) \neq 0 \Rightarrow x \neq 0, -3$

$D_f = \mathbb{R} - \{-3, 0, 2, 5\}$ پ

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

ب) $[x]^2 - 2[x] - 3 \neq 0 \Rightarrow ([x]-3)([x]+1) \neq 0 \Rightarrow$ پ

$[x] - 3 \neq 0 \Rightarrow [x] \neq 3 \Rightarrow x \notin [3, 4)$

$[x] + 1 \neq 0 \Rightarrow [x] \neq -1 \Rightarrow x \notin [-1, 0)$

$D_f = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$

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

ب) $\underbrace{\left[x - \frac{1}{3}\right]}_t + \left[\frac{1}{3} - x\right] \geq 0 \Rightarrow t \in \mathbb{Z} \Rightarrow x - \frac{1}{3} \in \mathbb{Z} \Rightarrow D_f = \left\{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\right\}$ پ

$\sin x \neq 0$
 الف) $y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \tan x + 1 \neq 0 \Rightarrow \tan x \neq -1 \Rightarrow D_f = \mathbb{R} - \left\{ k\pi - \frac{\pi}{4}, \frac{k\pi}{2} \right\}$
 $\cot x \neq 0$
 ب) $1 - 2\sin^2 x \geq 0 \Rightarrow 1 \geq 2\sin^2 x \Rightarrow \sin^2 x \leq \frac{1}{2} \Rightarrow -\frac{1}{\sqrt{2}} \leq \sin x \leq \frac{1}{\sqrt{2}}$
 $\Rightarrow D_f = \left[k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4} \right]$
 ج-ب) $1 - 2\cos x \geq 0 \Rightarrow \cos x \leq \frac{1}{2}$  $\Rightarrow D_f = [2k\pi + \frac{\pi}{3}, 2k\pi + \frac{5\pi}{3}]$

الف) $2\sin x - 1 \geq 0 \Rightarrow 2\sin x \geq 1 \Rightarrow \sin x \geq \frac{1}{2} \Rightarrow D_f = \left[k\pi + \frac{\pi}{6}, k\pi + \frac{5\pi}{6} \right]$
 ب) $1 - 2\cos x \geq 0 \Rightarrow 2\cos x \leq 1 \Rightarrow \cos x \leq \frac{1}{2} \Rightarrow D_f = \left[k\pi + \frac{\pi}{3}, k\pi + \frac{5\pi}{3} \right]$
 استی بازه نباید از ابتدای آن که می‌ترسند

الف) $-1 \leq x^2 + 3x + 1 \leq 1 \xrightarrow{(1)} x^2 + 3x + 1 \leq 1 \Rightarrow x^2 + 3x \leq 0 \Rightarrow x(x+3) \leq 0$
 $\Rightarrow \begin{matrix} -\infty & -3 & 0 & +\infty \\ + & - & + & \end{matrix}$
 $\xrightarrow{(2)} x^2 + 3x + 1 \geq -1 \Rightarrow x^2 + 3x + 2 \geq 0 \Rightarrow (x+1)(x+2) \geq 0$
 $\Rightarrow \begin{matrix} -\infty & -2 & -1 & +\infty \\ + & - & + & \end{matrix}$
 $D_f = (1) \cap (2) = [-3, 0] \cap (\mathbb{R} - (-2, -1)) = [-3, -2] \cup [-1, 0]$
 ب) $0 \leq 5 - 2x \leq 1 \xrightarrow{(1)} 5 - 2x \leq 1 \Rightarrow 4 \leq 2x \Rightarrow x \geq 2$
 $\xrightarrow{(2)} 5 - 2x \geq 0 \Rightarrow 2x \leq 5 \Rightarrow x \leq \frac{5}{2}$
 $D_f = [2, \frac{5}{2}]$

الف) $1 - \log_3 x > 0 \Rightarrow \log_3 x < 1 \Rightarrow x < 3, x > 0 \Rightarrow D_f = (0, 3)$
 ب) $1 - \log_3 \frac{x}{2} > 0 \Rightarrow \log_3 \frac{x}{2} < 1 \Rightarrow x > \frac{1}{2}, x > 0 \Rightarrow D_f = \left(\frac{1}{2}, +\infty \right)$

الف) $2^x - x^2 - 1 \geq 0 \Rightarrow 2^x - x^2 \geq 1 \Rightarrow x - x^2 \geq 1 \Rightarrow -(x^2 - x + 1) \geq 0$
 $\Rightarrow -(x-3)(x-1) \geq 0 \Rightarrow (3-x)(x-1) \geq 0 \Rightarrow x \leq 3, x \geq 1 \Rightarrow D_f = [1, 3]$
 ب) $\frac{3x+5}{2x+4} \in \mathbb{W} \Rightarrow D_f = \left\{ x \mid x = -\frac{3k-5}{2k-4}, k \in \mathbb{W} \right\}$