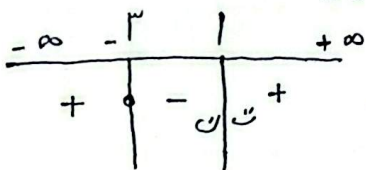


الف) $2x^3 + 3x^2 - 8x + 3 \neq 0 \Rightarrow (x-1)(2x-1)(x+3) \neq 0 \Rightarrow D_f = \mathbb{R} - \{1, \frac{1}{2}, -3\}$

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

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) $y = \sqrt{\frac{x+3}{x^2 - 2x^2 + 2x - 1}}$



$\Rightarrow D_f = (-\infty, -1] \cup (1, +\infty)$

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

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

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

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

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

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

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

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

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

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

$\Rightarrow [x + \frac{1}{3}] \geq 1 \Rightarrow x \geq \frac{1}{3} \Rightarrow D_f = [\frac{1}{3}, +\infty)$

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

$\sin x \neq 0$
 ا) $y = \frac{\cot x + 1}{\tan x + 1} \Rightarrow \tan x + 1 \neq 0 \Rightarrow \tan x \neq -1 \Rightarrow \mathbb{R} \cdot \left\{ k\pi - \frac{\pi}{4}, \frac{k\pi}{4} \right\}$
 $D_f =$
 ب) $1 - \sqrt{\sin^2 x} > 0 \Rightarrow 1 > \sqrt{\sin^2 x} \Rightarrow \sin^2 x < \frac{1}{4} \Rightarrow -\frac{1}{2} < \sin x < \frac{1}{2}$
 $\Rightarrow D_f = \left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6} \right]$

ا) $\sqrt{\sin x} - 1 > 0 \Rightarrow \sqrt{\sin x} > 1 \Rightarrow \sin x > \frac{1}{4} \Rightarrow D_f = \left[k\pi + \frac{\pi}{6}, k\pi + \frac{5\pi}{6} \right]$
 ب) $1 - \sqrt{\cos x} > 0 \Rightarrow \sqrt{\cos x} < 1 \Rightarrow \cos x < \frac{1}{4} \Rightarrow D_f = \left[k\pi + \frac{\pi}{3}, k\pi - \frac{\pi}{3} \right]$

ا) $-1 < x^2 + 3x + 1 < 1 \xrightarrow{(1)} x^2 + 3x + 1 < 1 \Rightarrow x^2 + 3x < 0 \Rightarrow x(x+3) < 0$
 $\Rightarrow \begin{array}{c} -\infty \quad -3 \quad 0 \quad +\infty \\ + \quad - \quad + \end{array}$
 $\xrightarrow{(2)} x^2 + 3x + 1 > -1 \Rightarrow x^2 + 3x + 2 > 0 \Rightarrow (x+1)(x+2) > 0$
 $\Rightarrow \begin{array}{c} -\infty \quad -2 \quad -1 \quad +\infty \\ + \quad - \quad + \end{array}$
 $D_f = (1) \cap (2) = [-3, 0] \cap (\mathbb{R} - (-2, -1)) = [-3, -2] \cup [-1, 0]$
 ب) $0 < \Delta - 2x < 1 \xrightarrow{(1)} \Delta - 2x < 1 \Rightarrow 2x > \Delta \Rightarrow x > \frac{\Delta}{2}$
 $\xrightarrow{(2)} \Delta - 2x > 0 \Rightarrow 2x < \Delta \Rightarrow x < \frac{\Delta}{2}$
 $D_f = \left[\frac{\Delta}{2}, \frac{\Delta}{2} \right]$

ا) $1 - \log \frac{x}{r} > 0 \Rightarrow \log \frac{x}{r} < 1 \Rightarrow x < r, x > 0 \Rightarrow D_f = (0, r)$
 ب) $1 - \log \frac{x}{r} > 0 \Rightarrow \log \frac{x}{r} < 1 \Rightarrow x > \frac{1}{r}, x > 0 \Rightarrow D_f = \left(\frac{1}{r}, +\infty \right)$

ا) $\sqrt{x - x^2} - 1 > 0 \Rightarrow \sqrt{x - x^2} > 1 \Rightarrow x - x^2 > 1 \Rightarrow -(x^2 - x + 1) > 0$
 $\Rightarrow -(x - \frac{1}{2})^2 + \frac{3}{4} > 0 \Rightarrow (x - \frac{1}{2})^2 < \frac{3}{4} \Rightarrow x < \frac{1}{2} + \frac{\sqrt{3}}{2}, x > \frac{1}{2} - \frac{\sqrt{3}}{2} \Rightarrow D_f = \left[\frac{1}{2} - \frac{\sqrt{3}}{2}, \frac{1}{2} + \frac{\sqrt{3}}{2} \right]$
 ب) $\frac{x + \Delta}{x + r} \in \mathbb{W} \Rightarrow D_f = \left\{ x \mid x = -\frac{rk - \Delta}{rk - r}, k \in \mathbb{W} \right\}$