

الف) $\frac{(x+3)}{(x-1)(2x^2+5x-3)} = \frac{(x+3)}{(x+3)(x-1)(x-1)} \Rightarrow \mathbb{R} - \{-3, \frac{1}{2}, 1\}$

ب) $\frac{(x+3)}{(x+3)(2x+1)(x+1)} = 0 \Rightarrow \mathbb{R} - \{-3, -\frac{1}{2}, -1\}$ ریشه های مخرج نباید صفر شوند.

الف) $\frac{(x+3)}{x^2-2x^2+2x-1} = \frac{(x+3)}{(x-1)(x^2-x+1)} \Rightarrow \mathbb{R} - \{1\}$

ب) $\frac{(x+3)}{x^2-2x^2+2x-1} \geq 0 \rightarrow \frac{(x+3)}{(x-1)(x^2-x+1)} \geq 0$ Df: $[-\infty, -3] \cup (1, +\infty)$

$x^2-5|x-1|-2x+5 \neq 0 \begin{cases} x \geq 1 \rightarrow x^2-5x+5-2x+5=0 \text{ (I)} \\ x < 1 \rightarrow x^2+5x-5-2x+5=0 \text{ (II)} \end{cases}$ مخرج نباید صفر باشد

I) $x^2-7x+10=0 \rightarrow (x-2)(x-5)=0$
 II) $x^2+3x=0 \rightarrow x(x+3)=0$ Df: $\mathbb{R} - \{2, 5, -3\}$

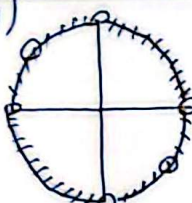
الف) $[-x]-2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow -x \in [2, +\infty) \Rightarrow x \in (-\infty, -2] = \text{Df}$

ب) $[x]^2-2[x]-3 \neq 0 \rightarrow ([x]-3)([x]+1) \neq 0 \rightarrow \begin{cases} [x] \neq 3 \Rightarrow x \notin [3, 4) \\ [x] \neq -1 \Rightarrow x \notin [-1, 0) \end{cases}$
 $\Rightarrow \text{Df} = \mathbb{R} - ([3, 4) \cup [-1, 0))$

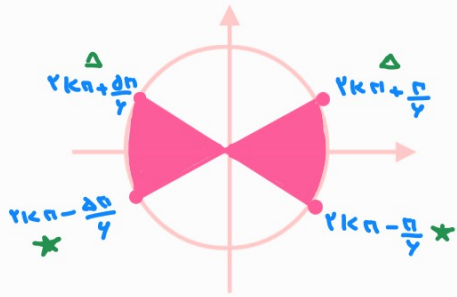
الف) $[x-\frac{1}{3}] + [x+\frac{2}{3}] \geq 0 \xrightarrow{+1} [x+\frac{2}{3}] + [x+\frac{2}{3}] \geq 1 \Rightarrow [x+\frac{2}{3}] \geq \frac{1}{2} \Rightarrow [x+\frac{2}{3}] \geq \frac{1}{2}$
 $\Rightarrow x+\frac{2}{3} \geq \frac{1}{2} \Rightarrow x \geq -\frac{1}{6}$ Df: $[-\frac{1}{6}, +\infty)$

ب) $[x-\frac{1}{3}] + [-(x-\frac{1}{3})] \geq 0 \xrightarrow{x-\frac{1}{3}=a} \begin{cases} a \in \mathbb{Z} \Rightarrow a=0 \\ a \notin \mathbb{Z} \Rightarrow a=-1 \end{cases} \Rightarrow x-\frac{1}{3} \in \mathbb{Z}$
Df: $\{x | x = k + \frac{1}{3}, k \in \mathbb{Z}\}$

$$D_f = \mathbb{R} - \left\{ k\pi + \frac{\pi}{2}, \frac{3\pi}{2} \right\}$$

الف) 	$\tan, \cot$ به ترتیب وقتی $\sin, \cos$ صفر شوند تعریف نمی شوند و همچنین خارج صفر نمی تواند باشد. ① $\rightarrow \tan x \neq -1 \Rightarrow x \neq k\pi + \frac{3\pi}{4}$ ② $\rightarrow \tan x \neq 0 \Rightarrow \cos x \neq 0 \Rightarrow x \neq k\pi$ $\sin x \neq 0 \Rightarrow x \neq k\pi + \pi$ ب) $1 - 4\sin^2 x \geq 0 \rightarrow \sin^2 x \leq \frac{1}{4} \Rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$ $D_f: [k\pi + \pi/6, k\pi + \pi/2]$ در این بازه هم $\sin x \leq \frac{1}{2}$ است
الف)	$2\sin x - 1 \geq 0 \rightarrow \sin x \geq \frac{1}{2} \Rightarrow \pi/6 \leq x \leq 5\pi/6 \Rightarrow D_f: [2k\pi + \pi/6, 2k\pi + 5\pi/6]$ ب) $1 - 2\cos x \geq 0 \rightarrow \cos x \leq \frac{1}{2} \rightarrow x \notin (2k\pi - \pi/3, 2k\pi + \pi/3)$ $\Rightarrow D_f = \mathbb{R} - (2k\pi - \pi/3, 2k\pi + \pi/3)$
الف)	جای $\sin x$ arc سین ا. و ا. باشد I) $\rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0$ II) $\rightarrow x^2 + 3x \leq 0 \rightarrow x(x+3) \leq 0$ $\Rightarrow (I) \cap (II) = [-2, 2] \cup [-3, -1]$ ب) ① $\rightarrow 4 - 2x \geq 0 \rightarrow x \leq 2$ ② $\rightarrow 1 - \sqrt{4 - 2x} \leq 1 \rightarrow \sqrt{4 - 2x} \geq 0 \rightarrow 4 - 2x \geq 0 \rightarrow x \leq 2$ $D_f = [2, \frac{4}{3}]$
الف)	① $\rightarrow x > 0$, ② $\rightarrow 1 - \log_3 x > 0 \rightarrow \log_3 x < 1 \rightarrow x < 3$ $\Rightarrow D_f = (0, 3)$ ب) $x > 0$, ③ $\rightarrow 1 - \log_{\frac{x}{4}} > 0 \rightarrow \log_{\frac{x}{4}} < 1 \rightarrow \frac{x}{4} < 4 \rightarrow x < 16$ $D_f = (\frac{1}{4}, 16)$
الف)	$2^{f(x-x^2)} - 1 \geq 0 \rightarrow 2^{f(x-x^2)} \geq 2^0 \rightarrow f(x-x^2) - 3 \geq 0$ ب) $\frac{3x+4}{2x+5} \in \mathbb{Z} \xrightarrow{\text{مخرج یکسان}} x \in -\frac{(2Z-4)}{2Z-3}$ $x^2 - 4x + 3 \leq 0 \rightarrow (x-1)(x-3) \leq 0$ $\Rightarrow x \in \frac{4-2Z}{-2+2Z} \Rightarrow D_f = \left\{ x \mid x \in \frac{4-2k}{-2+2k}, k \in \mathbb{Z} \right\}$ $D_f = [1, 3]$

4- ب) $1 - r \sin^2 n \geq 0 \rightarrow r \sin^2 n \leq 1 \rightarrow \sin^2 n \leq \frac{1}{r} \rightarrow -\frac{1}{r} \leq \sin n \leq \frac{1}{r}$



$\rightarrow D_f = [k\pi - \frac{\pi}{4}, k\pi + \frac{\pi}{4}]$