

الف) $y = \frac{x+3}{2x^3+3x^2-11x+3}$

$(x^2+5x-4)(x-1) \neq 0$
 $\frac{1}{x} \rightarrow -3 \rightarrow 1$

$$\begin{array}{r} -2x^3+3x^2-11x+3 \quad | \quad x-1 \\ -2x^3+2x^2-1x+3 \\ \hline 5x^2-12x \\ -5x^2+5x \\ \hline -7x+3 \\ -7x+7 \\ \hline 4 \end{array}$$

$D_f = \mathbb{R} - \left\{ -3, \frac{1}{4}, 1 \right\}$

ب) $y = \frac{x+3}{2x^3+9x^2+10x+3}$

$(2x^2+7x+3)(x+1) \neq 0$
 $\frac{1}{x} \rightarrow -3 \rightarrow -1$

$$\begin{array}{r} -2x^3+9x^2+10x+3 \quad | \quad x+1 \\ -2x^3+2x^2+10x+3 \\ \hline 7x^2+10x \\ -7x^2+7x \\ \hline 17x+3 \\ -17x-17 \\ \hline 20 \end{array}$$

$D_f = \mathbb{R} - \left\{ -3, -\frac{1}{4}, -\frac{1}{5} \right\}$

الف) $y = \frac{x+3}{x^3-2x^2+2x-1}$

$(x^2-x+1)(x-1) \neq 0$
 $\frac{1}{x} \rightarrow 1 \rightarrow 0$

$$\begin{array}{r} -x^3+2x^2-2x+1 \quad | \quad x-1 \\ -x^3+x^2-2x+1 \\ \hline x^2-2x \\ -x^2+x \\ \hline -x+1 \\ -x+1 \\ \hline 0 \end{array}$$

$D_f = \mathbb{R} - \{1\}$

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

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

$\frac{-1}{x+1} \geq 0$

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

$y = \frac{1}{x^2-5|x-1|-2x+5}$

$D_f = \mathbb{R} - \left\{ -3, 0, \frac{1}{5} \right\}$

① $x^2-5x+5-2x+5 = x^2-7x+10 = 0 \Rightarrow (x-2)(x-5) = 0$

② $x^2+5x-5-2x+5 = x^2+3x = 0 \Rightarrow x(x+3) = 0$

الف) $y = \sqrt{[-x]-2} \rightarrow [-x]-2 \geq 0 \rightarrow [-x] \geq 2 \rightarrow [x] \leq -2$

$D_f = (-\infty, -2]$

ب) $y = \frac{5x^2+4}{[x]^2-2[x]-3}$

$[x]^2-2[x]-3 = 0 \rightarrow [x] = -1 \rightarrow (-1, 0)$
 $[x] = 3 \rightarrow (3, 4)$

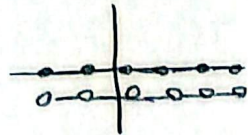
$D_f = \mathbb{R} - \left\{ [-1, 0) \cup (3, 4) \right\}$

این بازه ها نباید در دامنه باشند چون دینامی می هستند

الف) $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right]} \rightarrow \left[x - \frac{1}{x} + 1\right] + \left[x + \frac{1}{x}\right] \geq 1 \rightarrow 2\left[x + \frac{1}{x}\right] \geq 1 \rightarrow \left[x + \frac{1}{x}\right] \geq \frac{1}{2} \Rightarrow$

$x + \frac{1}{x} \geq 1 \rightarrow x \geq \frac{1}{x} \Rightarrow D_f = \left[\frac{1}{x}, +\infty\right)$

ب) $y = \sqrt{\left[x - \frac{1}{x}\right] + \left[\frac{1}{x} - x\right]}$



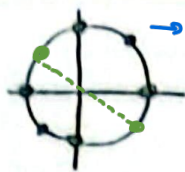
$x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$

$D_f = \left\{ x \mid x = k + \frac{1}{x}, k \in \mathbb{Z} \right\}$

الف) $y = \frac{\cot x + 1}{\tan x + 1}$

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$\tan x + 1 \neq 0 \rightarrow \tan x \neq -1$



$\rightarrow \tan x = 1 \checkmark$

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

$k\pi + \frac{\pi}{2}$

۱, ۲, ۵

ب) $y = \sqrt{1 - t \sin^2 x} \rightarrow 1 - t \sin^2 x \geq 0 \rightarrow t \sin^2 x \leq 1 \rightarrow \sin^2 x \leq \frac{1}{t} \rightarrow -\frac{1}{t} \leq \sin x \leq \frac{1}{t}$



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

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

انتهای بازه نباید از ابتدای بازه کوچکتر باشد!

الف) $y = \sqrt{t \sin x - 1} \rightarrow t \sin x - 1 \geq 0 \rightarrow t \sin x \geq 1 \rightarrow \sin x \geq \frac{1}{t}$



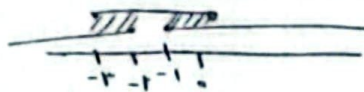
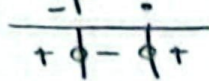
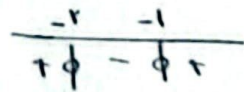
$D_f = [2k\pi + \frac{\pi}{4}, 2k\pi + \frac{5\pi}{4}]$

ب) $y = \sqrt{1 - t \cos x} \rightarrow 1 - t \cos x \geq 0 \rightarrow t \cos x \leq 1 \rightarrow \cos x \leq \frac{1}{t}$



$D_f = [2k\pi, 2k\pi + \frac{\pi}{2}] \cup [2k\pi + \frac{3\pi}{2}, 2k\pi + 2\pi]$

الف) $y = \arcsin(x^r, r x + 1) \rightarrow -1 \leq x^r + r x + 1 \leq 1 \rightarrow x^r + r x + 1 \geq -1 \rightarrow x^r + r x + 2 \geq 0 \rightarrow (-\infty, -r] \cup [-1, \infty)$



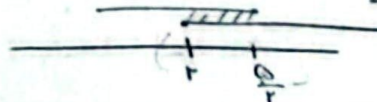
$D_f = [-r, -1] \cup [-1, 0]$

ب) $\cos y = \sqrt{a - r x}$

I: $a - r x \geq 0 \rightarrow r x \leq a \rightarrow x \leq \frac{a}{r}$

II: $-1 \leq \sqrt{a - r x} \leq 1 \rightarrow a - r x \leq 1 \rightarrow r x \geq a - 1 \rightarrow x \geq \frac{a - 1}{r}$

$r x \geq r \rightarrow x \geq r$



$D_f = [r, \frac{a}{r}]$

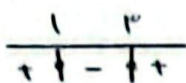
الف) $y = \log_r(1 - \log_r x)$ I: $1 - \log_r x > 0 \rightarrow \log_r x < 1 \rightarrow x < r$ II: $x > 0$ $D_f = (0, r)$

ب) $y = \log_r(1 - \log_{\frac{r}{t}} x)$ I: $1 - \log_{\frac{r}{t}} x > 0 \rightarrow \log_{\frac{r}{t}} x < 1 \rightarrow x > \frac{1}{r}$ II: $x > 0$ $D_f = (\frac{1}{r}, \infty)$

الف) $y = \sqrt{r^{f x - x^r} - 1}$

$r^{f x - x^r} - 1 \geq 0 \rightarrow r^{f x - x^r} \geq 1 \rightarrow f x - x^r \geq 0 \rightarrow x \geq \frac{f}{r}$

$x^r - f x + r \leq 0$



$D_f = [1, r]$

ب) $y = \left(\frac{r x + a}{r x + r} \right)!$

$\frac{r x + a}{r x + r} \in \mathbb{N} \rightarrow x = \frac{r w + a}{r w - r}$

$D_f = \{x \mid x = \frac{a - r k}{r k - r}, k \in \mathbb{N}\}$

ب) 4- $[n]^2 - 2[n] - 3 = 0 \xrightarrow{[n]=t} t^2 - 2t - 3 = 0 \rightarrow (t-3)(t+1) = 0$

$t=3 \rightarrow [n]=3 \rightarrow n \in [3, 4)$

$t=-1 \rightarrow [n]=-1 \rightarrow n \in [-1, 0)$

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

$\mathbb{R} - \left\{ \frac{1}{2} [3, 4) \cup [4, 5) \right\}$

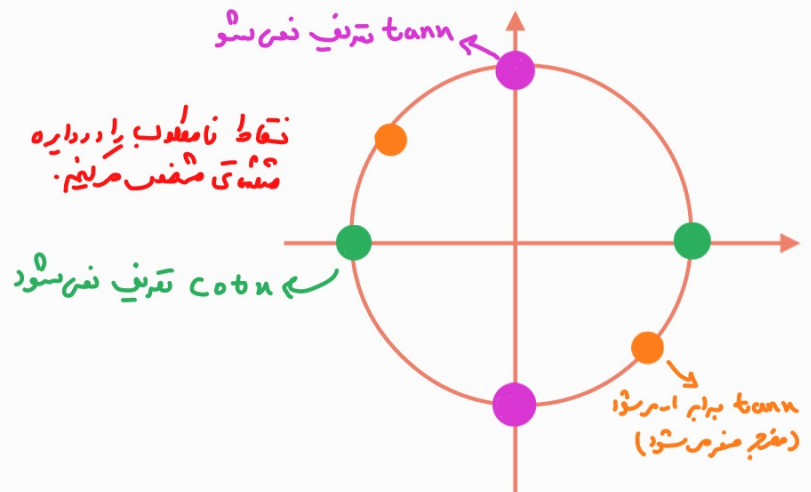
الف) 4- $y = \frac{\cot x + 1}{\tan x + 1}$

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

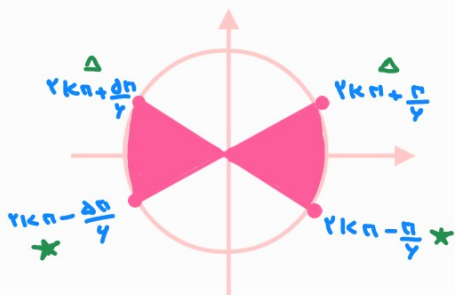
$x \neq k\pi + \frac{\pi}{4} \cup x \neq k\pi$

$\rightarrow x \neq \frac{k\pi}{4}$

$\rightarrow D_f = \mathbb{R} - \left\{ \frac{k\pi}{4}, k\pi + \frac{\pi}{4} \right\}$



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



$\rightarrow D_f = \left[2k\pi - \frac{\pi}{6}, 2k\pi + \frac{\pi}{6} \right]$