

$$\begin{array}{l} \text{الف) } \frac{x+3}{2x^3+3x^2-1x+3} \quad \begin{array}{l} 2x^3+3x^2-1x+3 \mid x-1 \\ -2x^3-3x^2 \\ \hline 6x^2-1x+3 \\ -6x^2-18x \\ \hline -19x+3 \\ -19x+19 \\ \hline 16 \end{array} \quad \begin{array}{l} x-1 \\ 2x^3+3x^2-1x+3 \\ \downarrow \\ x^2+3x-4 < \frac{1}{19} \\ -19 \end{array} \end{array}$$

$$(x^2+3x-4)(x-1) \neq 0 \Rightarrow D = R - \left\{ -\frac{1}{19}, \frac{1}{19} \right\}$$

$$\begin{array}{l} \text{ب) } \frac{x+3}{2x^3+9x^2+1x+3} \quad \begin{array}{l} 2x^3+9x^2+1x+3 \mid x+1 \\ -2x^3+2x^2 \\ \hline 11x^2+1x+3 \\ -11x^2-11x \\ \hline 12x+3 \\ -12x-12 \\ \hline 15 \end{array} \quad \begin{array}{l} x+1 \\ 2x^3+9x^2+1x+3 \\ \downarrow \\ x^2+9x+4 < \frac{1}{15} \\ -15 \end{array} \end{array}$$

$$(x^2+9x+4)(x+1) \neq 0 \Rightarrow D = R - \left\{ -\frac{1}{15}, -\frac{1}{15}, -\frac{1}{15} \right\}$$

$$\begin{array}{l} \text{الف) } \frac{x+3}{x^3-2x^2+2x-1} \quad \begin{array}{l} x^3-2x^2+2x-1 \mid x-1 \\ -x^3+2x^2 \\ \hline 4x-1 \\ -4x+4 \\ \hline 3 \end{array} \quad \begin{array}{l} x-1 \\ x^3-2x^2+2x-1 \\ \downarrow \\ x^2-2x+1 < \frac{1}{3} \\ 3 \end{array} \end{array}$$

$$(x^2-2x+1)(x-1) \neq 0 \Rightarrow D = R - \left\{ \frac{1}{3} \right\}$$

$$\begin{array}{l} \text{ب) } \sqrt{\frac{x+3}{x^3-2x^2+2x-1}} \geq 0 \quad \begin{array}{l} x^3-2x^2+2x-1 \mid x-1 \\ -x^3+2x^2 \\ \hline 4x-1 \\ -4x+4 \\ \hline 3 \end{array} \quad \begin{array}{l} x-1 \\ x^3-2x^2+2x-1 \\ \downarrow \\ x^2-2x+1 < \frac{1}{3} \\ 3 \end{array} \end{array}$$

$$D = (-\infty, \frac{1}{3}) \cup (1, \infty)$$

$$y = \frac{2}{x^2 - 5|x-1| - 2x + 5} \quad -3$$

$$\begin{aligned} x^2 - 5|x-1| - 2x + 5 &= x^2 - 7|x+1| = 0 \Rightarrow (x-2)(x-5) = 0 \\ &\quad x=2, x=5 \\ x^2 + 5|x-1| - 2x + 5 &= x^2 + 7|x+1| = 0 \Rightarrow x(x+7) = 0 \\ &\quad x=0 \\ &\quad x=-7 \end{aligned}$$

$$D = \mathbb{R} - \{-7, 0, 2, 5\}$$

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$$\begin{aligned} \text{الف) } \sqrt{[-x]-2} &\Rightarrow [-x]-2 \geq 0 \quad [-x] \geq 2 \\ &\quad [x] \leq 2 \quad D = (-\infty, 2] \quad [-10] \\ \text{ب) } \frac{5x^2+4}{[x]^2-2[x]-3} &\quad [x]^2-2[x]-3=0 \quad [x] = 3 \quad [3, 4] \\ &\quad \text{این ۲ بازه نباید در دامنه آید} \quad D = [-1, 0) \cup [3, 4] \quad (1, 10) \end{aligned}$$

$$D \neq \mathbb{R} - \{[-1, 0) \cup [3, 4]\}$$

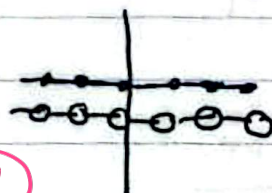
$$\text{الف) } \sqrt{\left[x - \frac{1}{x}\right] + \left[x + \frac{1}{x}\right]} \rightarrow \left[x - \frac{1}{x} + 1\right] + \left[x + \frac{1}{x}\right] \geq 1 \quad -5$$

$$\rightarrow 2\left[x + \frac{1}{x}\right] \geq 1 \rightarrow \left[x + \frac{1}{x}\right] \geq \frac{1}{2} \Rightarrow x + \frac{1}{x} \geq 1 \rightarrow x \geq \frac{1}{x}$$

$$D = \left[\frac{1}{x} + 5\right)$$

$$\text{ب) } \sqrt{\left[x - \frac{1}{x}\right] + \left[\frac{1}{x} - x\right]} \quad x - \frac{1}{x} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{x}$$

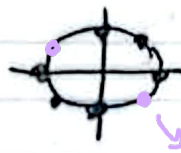
$$D = \left\{x \mid x = k + \frac{1}{x}, k \in \mathbb{Z}\right\}$$



۲

این ۲ نقطه مضرب در ۱ $\tan \theta = 1$ می باشد!

الف) $\frac{\cos \theta + 1}{\tan \theta + 1}$



$\tan \theta + 1 \neq 0$

$\tan \theta \neq -1$

$\frac{\sin}{\cos} > 0$

(1, 20)

$D = R - \left\{ \frac{k\pi}{2}, k\pi + \frac{\pi}{2} \right\}$

$\tan \theta = -1$

ب) $\sqrt{1 - 4 \sin^2 \theta}$

$1 - 4 \sin^2 \theta \geq 0$

$-\frac{1}{2} \leq \sin \theta \leq \frac{1}{2}$

$D = \left[k\pi + \frac{7\pi}{4}, k\pi + \frac{\pi}{4} \right]$

انتهای بازه نباید از ابتدای بازه کوچک تر باشد



الف) $\sqrt{2 \sin \theta - 1}$ $2 \sin \theta - 1 \geq 0$ $\sin \theta \geq \frac{1}{2}$ -V

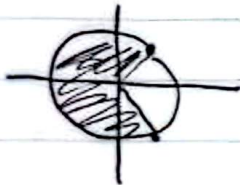


$D = \left[2k\pi + \frac{\pi}{6}, 2k\pi + \frac{5\pi}{6} \right]$

(1, 50)

ب) $\sqrt{1 - 2 \cos \theta}$

$1 - 2 \cos \theta \geq 0$ $\cos \theta \leq \frac{1}{2}$



$D = \left[2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3} \right]$

الف) $\arcsin(x^2 + 3x + 1)$

$-1 \leq x^2 + 3x + 1 \leq 1$

$\frac{-3}{2} \leq x \leq \frac{-1}{2}$

$x^2 + 3x + 1 \geq -1$ $x^2 + 3x + 2 \geq 0$

$(x+2)(x+1) \geq 0$

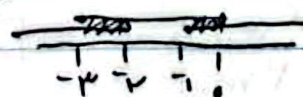
$(-\infty - 2] \cup [-1 + \infty)$

$x^2 + 3x + 1 \leq 1$ $x^2 + 3x \leq 0$

$x(x+3) \leq 0$ $[-3, 0]$

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

(2)



$$-.) \cos y = \sqrt{\omega - 2n}$$

$$\omega - 2n > 0$$

$$n \leq \frac{\omega}{2}$$

$$-1 \leq \sqrt{\omega - 2n} \leq 1$$

$$\omega - 2n \leq 1$$

$$n \geq \frac{\omega - 1}{2}$$

$$D = \left[\frac{\omega - 1}{2}, \frac{\omega}{2} \right]$$

$$-.) \log_r (1 - \log_r^n)$$

$$1 - \log_r^n > 0 \rightarrow \log_r^n < 1 \rightarrow n < r^0$$

$$n > 0$$

$$D = (0, 1]$$

$$-.) \log_r (1 - \log_r^n)$$

$$1 - \log_r^n > 0 \rightarrow \log_r^n < 1$$

$$n < \frac{1}{r}$$

$$n > 0$$

$$D = \left(\frac{1}{r}, 0 \right)$$

چون متناهی است و اوست مثبت نامحدود بعضی میشود!

$$\log_r^n < 1 \rightarrow n > \frac{1}{r} \rightarrow D = \left(\frac{1}{r}, +\infty \right)$$

$$-.) \sqrt{\frac{r^n - n^r}{r}} - 1$$

$$\frac{r^n - n^r}{r} - 1 \geq 0$$

$$\frac{r^n - n^r}{r} \geq 1$$

$$r^n - n^r \geq r \rightarrow n^r - r^n + r \leq 0$$

$$(n - r)(n - 1)$$

$$D = [1, r]$$

$$-.) \left(\frac{r^n + \omega}{r^n + \epsilon} \right)!$$

$$\frac{r^n + \omega}{r^n + \epsilon} \in W$$

$$\Rightarrow n = \frac{r^n + \omega}{r^n - r}$$

$$D = \left\{ n \mid n = \frac{\omega - r^n}{r^n - r}, r \in W \right\}$$

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

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

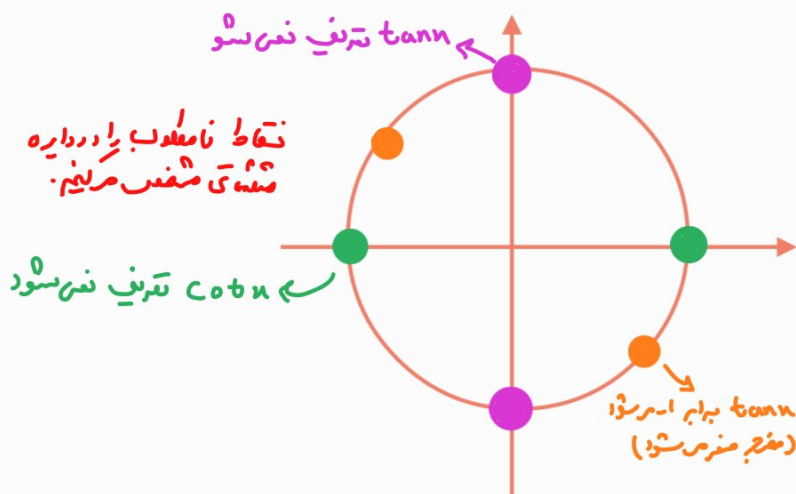
$t=-1 \rightarrow [n]=-1 \rightarrow n \in [-1, 0)$

$\rightarrow \text{Df}_z = (-\infty, -1) \cup [3, 4) \cup [4, +\infty)$

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

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

نقاط نامعلوم را در دایره
مستوی مشخص میکنیم.



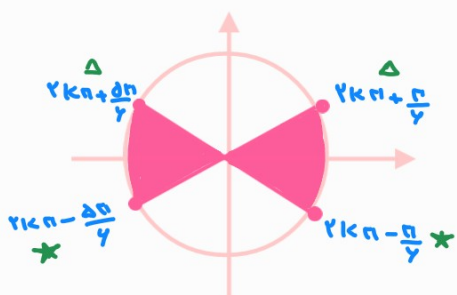
$x \neq k\pi + \frac{\pi}{2}$

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

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

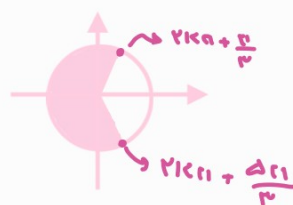
$\rightarrow \text{Df}_z = \mathbb{R} - \left\{ \frac{k\pi}{4}, k\pi + \frac{\pi}{4} \right\}$

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



$\rightarrow \text{Df}_z = \left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6} \right]$

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



$\rightarrow \text{Df}_z = \left[r(k\pi + \frac{\pi}{3}, r(k\pi + \frac{2\pi}{3}) \right]$

$$9 - \text{ب}) \quad y = \log_2 \left(1 - \log_2^n \frac{1}{r} \right) \rightarrow \log_2^n \frac{1}{r} \rightarrow n > 0.$$

$$\hookrightarrow 1 - \log_2^n \frac{1}{r} > 0 \rightarrow \log_2^n \frac{1}{r} < 1 \xrightarrow{\text{من بابين (1) و (2)}} n > \frac{1}{r}$$

$$Df_2 \left(\frac{1}{r}, +\infty \right)$$