

الف) $\frac{x+3}{2x^2+5x-12} \rightarrow x=-3$

$2x^2+5x-12 \xrightarrow{\div x-1} (x-1)(2x-1)(x+3) \rightarrow x=-3, 1, \frac{1}{2}$

$$\begin{array}{r} 2x^2+5x-12 \quad \div x-1 \\ \underline{2x^2-2x+2} \\ 7x-14 \\ \underline{7x-7} \\ -7 \end{array} \quad \begin{array}{r} 2x^2+5x-12 \quad \div x-1 \\ \underline{2x^2-2x+2} \\ 7x-14 \\ \underline{7x-7} \\ -7 \end{array}$$

$$D_f = \mathbb{R} - \left\{ -3, \frac{1}{2}, 1 \right\}$$

ب) $\frac{x+3}{2x^2+9x+10} \rightarrow x=-3$

$2x^2+9x+10 \xrightarrow{\div x+1} (x+1)(2x+1)(x+3) \rightarrow x=-3, -1, -\frac{1}{2}$

$$\begin{array}{r} 2x^2+9x+10 \quad \div x+1 \\ \underline{2x^2+2x+2} \\ 7x+8 \\ \underline{7x+7} \\ 1 \end{array} \quad \begin{array}{r} 2x^2+9x+10 \quad \div x+1 \\ \underline{2x^2+2x+2} \\ 7x+8 \\ \underline{7x+7} \\ 1 \end{array}$$

$$D_f = \mathbb{R} - \left\{ -3, -\frac{1}{2}, -1 \right\}$$

الف) $\frac{x+3}{x^2-2x^2+2x-1} \xrightarrow{\div x-1} (x-1)(x^2-x+1)$

$$\begin{array}{r} x^2-2x^2+2x-1 \quad \div x-1 \\ \underline{x^2-x+1} \\ -x+2 \\ \underline{-x+1} \\ 1 \end{array} \quad \begin{array}{r} x^2-2x^2+2x-1 \quad \div x-1 \\ \underline{x^2-x+1} \\ -x+2 \\ \underline{-x+1} \\ 1 \end{array}$$

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

ب) $x = -3, 1$

$$\begin{array}{c} -3 \quad 1 \\ + \quad - \quad + \quad + \end{array}$$

$$D_f = (-\infty, -3] \cup (1, +\infty)$$

$y = \frac{2}{x^2-5|x-1|-2x+6}$

$x \geq 1 \rightarrow x^2-5x+1 \neq 0 \rightarrow (x-2)(x-3) \neq 0 \rightarrow x \neq 2, 3$

$x \leq 1 \rightarrow x^2+5x-6-2x \neq 0 \rightarrow x^2+3x \rightarrow x(x+3) \neq 0$
 $x \neq 0, -3$

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

(4)

الف) $[-x] - 2 \geq 0$

$$[-x] \geq 2 \rightarrow x \leq -2 \rightarrow D_f = (-\infty, -2]$$

ب) $[x]^2 - 2[x] - 2 \neq 0$

$$([x] - 3)([x] + 1) \neq 0$$

$$[x] \neq 3 \rightarrow 3 \leq x < 4$$

$$[x] \neq -1 \rightarrow -1 \leq x < 0$$

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

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

$$[x + \frac{2}{3}] + [x + \frac{2}{3}] \geq 1$$

$$[x + \frac{2}{3}] \geq \frac{1}{2} \rightarrow [x + \frac{2}{3}] \geq 1$$

$$x + \frac{2}{3} \geq 1$$

$$x \geq \frac{1}{3}$$

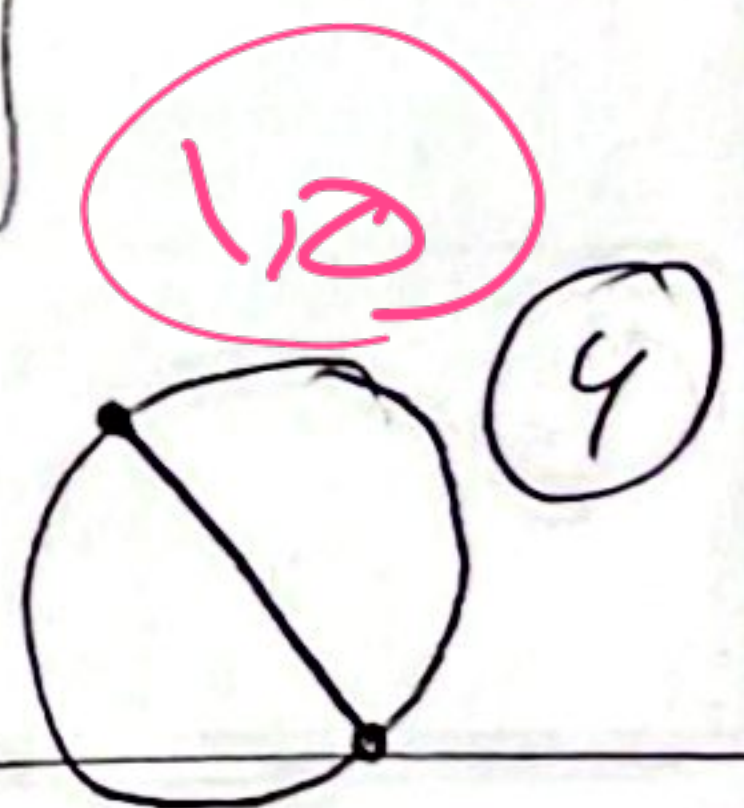
$$D_f = [\frac{1}{3}, +\infty)$$

ب) $[x - \frac{1}{3}] + [-\frac{(x + \frac{1}{3})}{a}] \geq 0 \rightarrow a \in \mathbb{Z} \rightarrow [a] + [-a] = 0$ ✓
 $a \notin \mathbb{Z} \rightarrow [a] + [-a] = -1$ ✗

$$x - \frac{1}{3} \in \mathbb{Z} \rightarrow x \in \mathbb{Z} + \frac{1}{3} \rightarrow D_f = \{x \mid x = k + \frac{1}{3}, k \in \mathbb{Z}\}$$

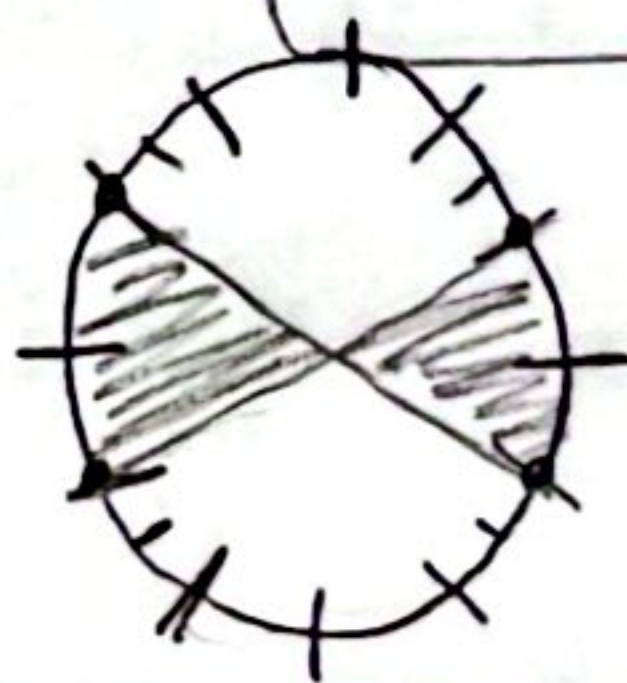
tan و cot باید تعریف شوند!

الف) $\tan x \neq -1 \rightarrow x \neq 135^\circ, 315^\circ \rightarrow D_f = \mathbb{R} - \{k\pi + \frac{3\pi}{4} \mid k \in \mathbb{Z}\}$



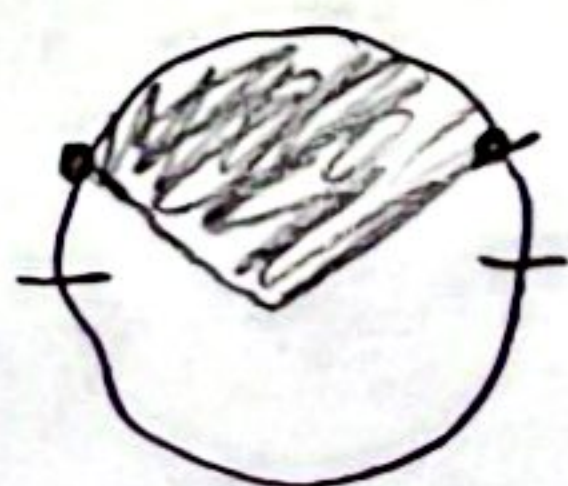
ب) $1 - \sin^2 x \geq 0$

$$\sin^2 x \leq \frac{1}{4} \rightarrow -\frac{1}{2} \leq \sin x \leq \frac{1}{2}$$



$$D_f = [k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6}]$$

الف) $\sin x \geq \frac{1}{2}$



$$D_f = [2k\pi + \frac{\pi}{6}, (2k+1)\pi + \frac{5\pi}{6}]$$

ب) $1 - 2\cos x \geq 0$

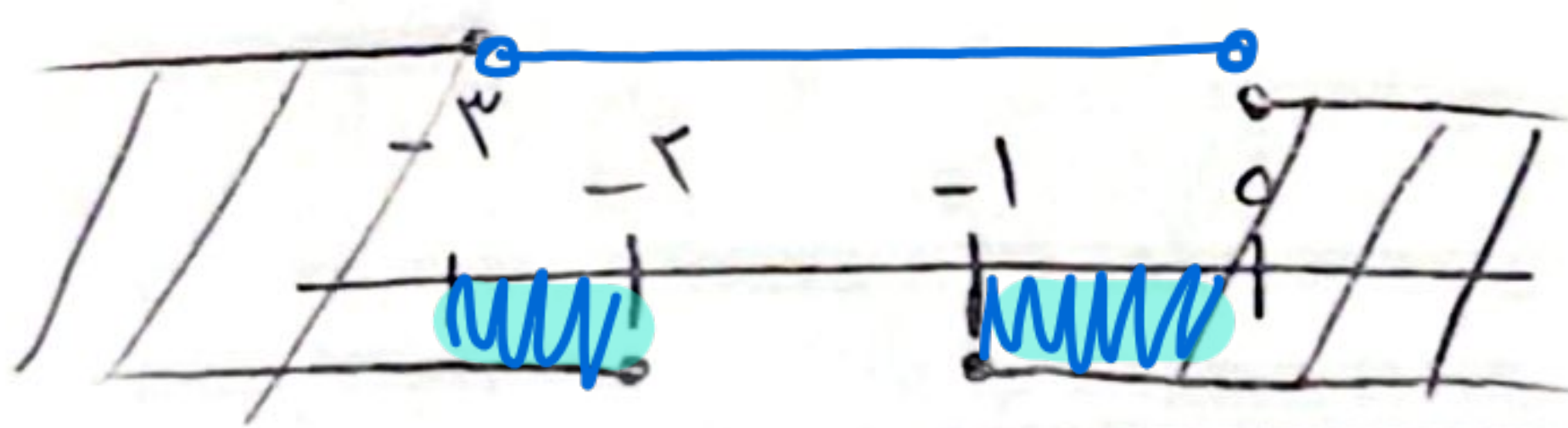
$$\cos x \leq \frac{1}{2}$$



$$D_f = [2k\pi + \frac{\pi}{3}, (2k+1)\pi + \frac{5\pi}{3}]$$

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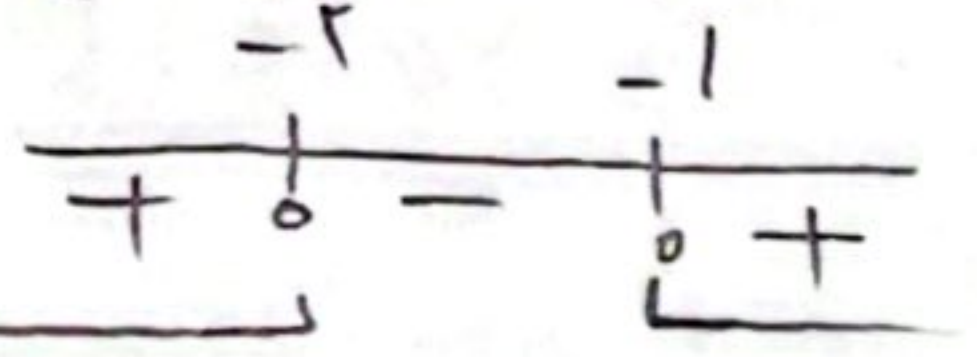


الف) $-1 < x^2 + 3x + 1 < 1$

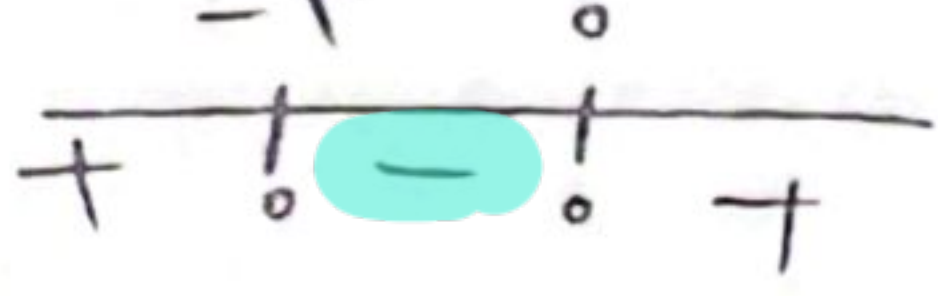
$x^2 + 3x + 1 \geq -1$

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

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



$x^2 + 3x \leq 0$



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

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

ب) $0 < \sqrt{5-2x} < 1$

$0 \leq 5-2x \leq 1$
 $x \leq 5/2$ $2 \leq x$

$D_f = [2, 5/2]$

الف) $\log_r(1-\log_r x) \rightarrow x > 0$

$1-\log_r x > 0 \rightarrow \log_r x < 1 \rightarrow x < r$

۹ $D_f = (0, r)$

ب) $\log_r(1-\log_{\frac{1}{r}} x) \rightarrow 1: x > 0$

$\rightarrow 2: \log_{\frac{1}{r}} x < 1 \rightarrow x > \frac{1}{r}$

۲ $D_f = (\frac{1}{r}, +\infty)$

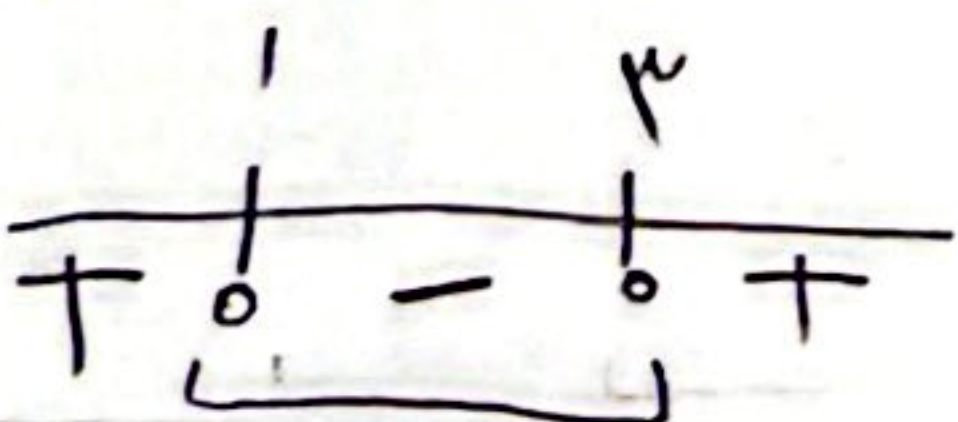
الف) $\frac{r^x - x^r}{r} - 1 \geq 0$

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

$r^x - x^r \geq r$

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

$(x-1)(x-2) \leq 0$



$D_f = [1, 2]$

ب) $\frac{rx + \omega}{rx + r} \in \omega$

$rx + \omega \in rx\omega + r\omega$

$rx - rx\omega \in r\omega - \omega$

$x(r - r\omega) \in \frac{r\omega - \omega}{r - r\omega}$

$x \in \frac{r\omega - \omega}{r - r\omega}$

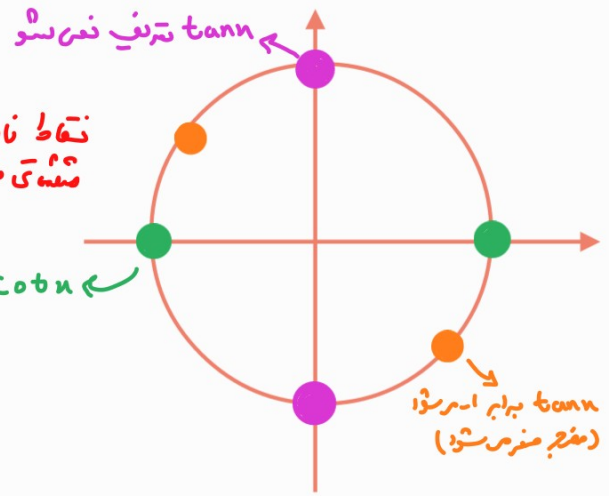
$D_f = \{x | x = \frac{rk - \omega}{r - rk}, k \in \omega\}$

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

نقاط نامعلوم را در دایره
متناهی مشخص میکنیم.

$\cot x$ تعریف نمیشود



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

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

$\hookrightarrow x \neq \frac{k\pi}{p}$

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

8- الف) $-1 \leq x^2 + \frac{3}{x} + 1 \leq 1 \xrightarrow{\frac{9}{4} - \frac{9}{4}} -1 \leq x^2 + \frac{3}{x} + \frac{9}{4} - \frac{9}{4} \leq 1$

$\frac{1}{4} \leq x^2 + \frac{3}{x} + \frac{9}{4} \leq \frac{9}{4} \rightarrow \frac{1}{4} \leq \left(x + \frac{3}{x}\right)^2 \leq \frac{9}{4}$

$\cap \left(x + \frac{3}{x}\right)^2 \leq \frac{9}{4} \rightarrow -\frac{3}{x} \leq x + \frac{3}{x} \leq \frac{3}{x} \rightarrow -3 \leq x \leq 0 \quad I$

$\cup \left(x + \frac{3}{x}\right)^2 \geq \frac{1}{4} \rightarrow x + \frac{3}{x} \geq \frac{1}{x} \rightarrow x \geq -1 \quad \cup \quad x + \frac{3}{x} \leq -\frac{1}{x} \rightarrow x \leq -2 \quad II$

$I \cap II \rightarrow D_f = [-3, -2] \cup [-1, 0]$