

الف) $y = \frac{(x+2)}{2x^3 + 2x^2 - 11x + 3}$ $\rightarrow (x-1)(2x-1)(x+3)$ $\rightarrow D_f: \mathbb{R} - \{1, \frac{1}{2}, -3\}$

ب) $y = \frac{x+2}{2x^3 + 9x^2 + 6x + 2}$ $\rightarrow (x+1)(x+2)(2x+1)$ $\rightarrow D_f: \mathbb{R} - \{-1, -2, -\frac{1}{2}\}$

الف) $y = \frac{x+2}{x^3 - 2x^2 + 2x - 1}$ $\rightarrow (x-1)(x^2 - x + 1)$ $\rightarrow D_f: \mathbb{R} - \{1, \text{roots of } x^2 - x + 1\}$

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$y = \frac{x}{x^3 - 5x^2 + 4x + 5}$ $\rightarrow (x-1)(x-2)(x+5)$ $\rightarrow D_f: \mathbb{R} - \{1, 2, -5\}$

الف) $y = \sqrt{-x-2}$ $\rightarrow [-x-2] \geq 0 \rightarrow [-x] \geq 2 \rightarrow x \leq -2 \rightarrow D_f: (-\infty, -2]$

ب) $y = \frac{5x^2 + 4}{[x]^2 - 2[x] - 3}$ $\rightarrow [x]^2 - 2[x] - 3 \neq 0 \rightarrow ([x]-3)([x]+1) \neq 0$

$x \in \mathbb{R} \rightarrow [x] \in \mathbb{Z} \rightarrow [x] \neq 3, -1 \rightarrow x \in \mathbb{R} - \{[x] = 3, -1\}$ $\rightarrow D_f: \mathbb{R} - \{[x] = 3, -1\}$

الف) $y = \sqrt{[x - \frac{1}{n}] + [x + \frac{1}{n}]} \geq 0 \rightarrow [x - \frac{1}{n}] + [x + \frac{1}{n}] \geq 0$

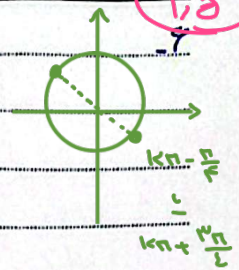
$\rightarrow [x + \frac{1}{n}] \geq \frac{1}{n} \rightarrow x + \frac{1}{n} \geq 1 \rightarrow x \geq \frac{1}{n} \rightarrow D_f: [\frac{1}{n}, +\infty)$

ب) $y = \sqrt{[x - \frac{1}{n}] + [x + \frac{1}{n}]} \geq 0 \rightarrow [x - \frac{1}{n}] \geq 0 \rightarrow x \geq \frac{1}{n}$

$D_f: \{x | x \leq k+1, k \in \mathbb{Z}\}$

$$\text{الف) } y = \frac{\cos x + 1}{\tan x + 1} \rightarrow x \neq k\pi + \frac{\pi}{2}$$

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



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

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

$$D_f = \left[\frac{k\pi}{2}, \frac{k\pi}{2} \right]$$

$$\text{الف) } y = \sqrt{1 - \sin^2 x} \rightarrow 1 - \sin^2 x \geq 0 \rightarrow \sin^2 x \leq 1$$

$$D_f = \left[\frac{k\pi}{2}, \frac{k\pi}{2} \right]$$



$$\text{ب) } y = \sqrt{1 - \cos^2 x} \rightarrow 1 - \cos^2 x \geq 0 \rightarrow \cos^2 x \leq 1$$

$$D_f = \left[\frac{k\pi}{2}, \frac{k\pi}{2} \right]$$



$$\text{الف) } y = \arcsin(x^2 + 1) \rightarrow x^2 + 1 \leq 1 \rightarrow x^2 \leq 0 \rightarrow x = 0$$

$$\rightarrow x^2 + 1 \geq -1 \rightarrow x^2 \geq -2 \rightarrow x \in \mathbb{R}$$

$$D_f = \{0\}$$

$$\text{ب) } \cos y = \sqrt{\omega - x} \rightarrow \sqrt{\omega - x} \leq 1 \rightarrow \omega - x \leq 1 \rightarrow x \geq \omega - 1$$

$$\omega - x \geq 0 \rightarrow x \leq \omega$$

$$D_f = [\omega - 1, \omega]$$

$$\text{الف) } y = \log_r(1 - \log^2 x) \rightarrow 1 - \log^2 x > 0 \rightarrow \log^2 x < 1 \rightarrow x < r, x > \frac{1}{r}$$

$$\text{ب) } y = \log_r(1 - \log^2 x) \rightarrow 1 - \log^2 x > 0 \rightarrow \log^2 x < 1 \rightarrow x > \frac{1}{r}, x < r$$

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

$$\text{الف) } y = \sqrt{r^{x-a} - 1} \rightarrow r^{x-a} - 1 \geq 0 \rightarrow r^{x-a} \geq 1 \rightarrow x - a \geq 0 \rightarrow x \geq a$$

$$\rightarrow r^{x-a} \leq 1 \rightarrow (x-a) \leq 0 \rightarrow x \leq a$$

$$D_f = [a, a]$$

$$\frac{1}{r} - 1 +$$

$$\text{ب) } y = \left(\frac{r^{x+\omega}}{r^{x+\omega}} \right)! \rightarrow \frac{r^{x+\omega}}{r^{x+\omega}} \leq 1 \rightarrow \frac{r^{x+\omega}}{r^{x+\omega}} \leq 1 \rightarrow \frac{r^{x+\omega}}{r^{x+\omega}} \leq 1$$

$$D_f = \left[a, \frac{\omega - \frac{1}{r}}{r - 1}, \frac{\omega - \frac{1}{r}}{r - 1} \right]$$

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۲- الف) $x^3 - 2x^2 + 2x - 1 = 0$ $\xrightarrow[\text{نقش بنویس بر } x-1]{\text{مجموع ضرایب صفر است}}$ $(x-1)(x^2 - x + 1) = 0$

$\begin{cases} x-1=0 \rightarrow x=1 \\ x^2-x+1=0 \end{cases} \xrightarrow{\Delta < 0} \text{ریشه حقیقی ندارد} \rightarrow D_f = \mathbb{R} - \{1\}$

محاسبات سوالات اول و دوم:

$$\begin{array}{r} 2x^3 + 2x^2 - 1x + 2 \quad | \quad x-1 \\ 2x^3 - 2x^2 \\ \hline 4x^2 - 1x + 2 \\ 4x^2 - 4x \\ \hline 3x + 2 \\ 3x - 3 \\ \hline 5 \end{array} \rightarrow (x+1)(x - \frac{1}{5})$$

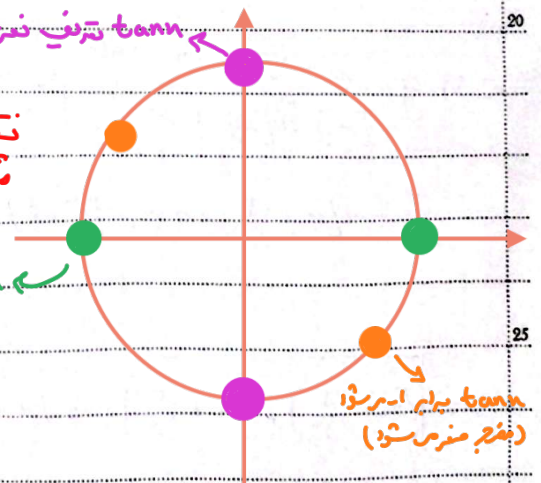
$$\begin{array}{r} x^3 - 2x^2 + 2x - 1 \quad | \quad x-1 \\ x^3 - x^2 \\ \hline -x^2 + 2x \\ -x^2 + x \\ \hline x-1 \\ x-1 \\ \hline 0 \end{array}$$

$$\begin{array}{r} 2x^3 + 2x^2 + 10x + 2 \quad | \quad x+1 \\ 2x^3 + 2x^2 \\ \hline 10x + 2 \\ 10x + 10 \\ \hline -8 \\ -8x - 8 \\ \hline 0 \end{array} \rightarrow (x+1)(2x+1)$$

۴- الف) $y = \frac{\cot x + 1}{\tan x + 1} \rightarrow$ نقاط نامطلوب را در دایره
مستطقی مشخص میکنیم.

$\cot x$ تعریف نمیشود

$\tan x$ تعریف نمیشود



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

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

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

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

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