

الف) جواب $\mathbb{R} - \{1, -\frac{1}{2}\}$

$$\frac{x+3}{2x^3+3x^2-8x+3} = \frac{x+3}{(x-1)(2x^2+5x-3)} \Rightarrow \Delta = 25+24=49 \rightarrow \frac{-5 \pm \sqrt{49}}{4} = (-3, \frac{1}{2})$$

تجزیه ضرایب

ب) جواب $\mathbb{R} - \{-3, \frac{1}{2}, -1\}$

$$\frac{x+3}{2x^3+9x^2+10x+3} = \frac{x+3}{(x+1)(2x^2+7x+3)} \Rightarrow \Delta = 49-24=25 \rightarrow \frac{-7 \pm \sqrt{25}}{4} = (-3, -\frac{1}{2})$$

تجزیه ضرایب

الف) $\mathbb{R} - \{1\}$

$$\frac{x+3}{x^3-2x^2+2x-1} = \frac{x+3}{(x-1)(x^2-x+1)} \Rightarrow \Delta = 1-4 = -3$$

تجزیه ضرایب

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

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

تجزیه ضرایب

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$$x \geq 1 \rightarrow x^2-7x+10 \neq 0 \rightarrow (x-2)(x-5) \neq 0 \Rightarrow \mathbb{R} - \{2, 5\}$$

$$x < 1 \rightarrow x^2+3x \neq 0 \rightarrow x(x+3) \neq 0 \Rightarrow \mathbb{R} - \{0, -3\}$$

جواب نهایی $\mathbb{R} - \{-3, 0, 2, 5\}$

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

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$$y = \frac{5x^2+9}{[x^2]-2[x]-3} \neq 0 \Rightarrow ([x]-3)([x]+1) \neq 0$$

جواب نهایی $(-\infty, -1) \cup [3, 4) \cup (4, +\infty)$

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$$\sqrt{[x-\frac{1}{4}]+[x+\frac{1}{4}]} \geq 0 \Rightarrow [x-\frac{1}{4}]+[x+\frac{1}{4}] \geq 0 \Rightarrow 2[x-\frac{1}{4}] \geq -1 \Rightarrow [x-\frac{1}{4}] \geq -\frac{1}{2}$$

تجزیه ضرایب

جواب نهایی $\{x | x = k + \frac{1}{4}, k \in \mathbb{Z}\}$

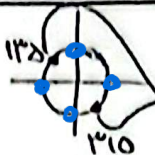
قرینه

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

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

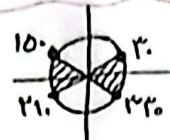
ban, cotn باید تعریف شوند!

$$\frac{\cos x + 1}{\tan x + 1} \neq 0 \rightarrow \tan x \neq -1$$



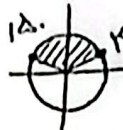
$$\tan x = -1 \rightarrow \mathbb{R} - \left\{ k\pi + \frac{3\pi}{2} \right\}$$

$$y = \sqrt{1 - 5\sin^2 x} \geq 0 \rightarrow \sin^2 x \geq \frac{1}{5} \rightarrow \frac{1}{\sqrt{5}} \leq |\sin x| \leq \frac{1}{\sqrt{5}}$$



$$\left[k\pi - \frac{\pi}{6}, k\pi + \frac{\pi}{6} \right] \leftarrow \text{جواب}$$

$$y = \sqrt{2\sin x - 1} \geq 0 \rightarrow 2\sin x \geq 1 \rightarrow \sin x \geq \frac{1}{2}$$



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

له جواب

$$y = \sqrt{1 - 2\cos x} \geq 0 \rightarrow 2\cos x \leq 1 \rightarrow \cos x \leq \frac{1}{2}$$



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

$$y = \arcsin(x^2 + 3x + 1) \rightarrow -1 \leq x^2 + 3x + 1 \leq 1 \rightarrow x^2 + 3x \leq 0 \rightarrow \frac{-3}{2} \leq x \leq 0$$

$$-1 \leq x^2 + 3x + 1 \rightarrow x^2 + 3x + 2 \geq 0 \rightarrow (x+1)(x+2) \geq 0 \rightarrow x \leq -2 \text{ or } x \geq -1$$

$$\frac{-2}{-1} \rightarrow (-\infty, -2] \cup [1, +\infty)$$

$$x(x+3) \geq 0 \rightarrow x \leq -3 \text{ or } x \geq 0$$

$$[-3, 0]$$

$$\cos y = \sqrt{5-2x} \rightarrow -1 \leq \sqrt{5-2x} \leq 1 \rightarrow 5-2x \leq 1 \rightarrow x \geq 2$$

$$5-2x \geq 0 \rightarrow 2x \leq 5 \rightarrow x \leq 2.5$$

$$[2, 2.5] \leftarrow \text{جواب}$$

$$[-2.5, -2] \cup [0, 0]$$

$$\log_y(1 - \log_x^2)$$

$$\rightarrow 1 - \log_x^2 > 0 \rightarrow \log_x^2 < 1 \rightarrow x < 3$$

$$x > 0$$

$$\log_y(1 - \log_{\frac{1}{x}}^2)$$

$$\rightarrow 1 - \log_{\frac{1}{x}}^2 > 0 \rightarrow \log_{\frac{1}{x}}^2 < 1 \rightarrow x > \frac{1}{3}$$

$$\left(\frac{1}{3}, +\infty \right)$$

$$y = \sqrt{2 \frac{fx - x^2}{-1}} \geq 0 \rightarrow 2 \frac{fx - x^2}{-1} \geq 0 \rightarrow fx - x^2 \geq 0 \rightarrow x^2 - fx + 3 \leq 0 \rightarrow (x-1)(x-3) \leq 0$$

$$\frac{1}{-1} \rightarrow [1, 3] \leftarrow \text{جواب}$$

$$y = \left(\frac{3x+5}{3x+7} \right)! \rightarrow \frac{3x+5}{3x+7} \in \mathbb{N} \rightarrow 3x+5 \in 3x\mathbb{N} + 7\mathbb{N} \rightarrow 3x - 2x\mathbb{N} \in 7\mathbb{N} - 5$$

$$x(3 - 2\mathbb{N}) \in 7\mathbb{N} - 5 \rightarrow x \in \frac{7\mathbb{N} - 5}{3 - 2\mathbb{N}} \rightarrow \left\{ x \mid x = \frac{7k-5}{3-2k}, k \in \mathbb{N} \right\}$$

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

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

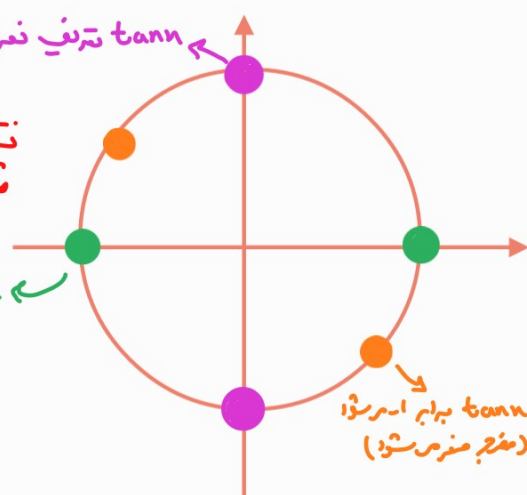
$$x \neq k\pi + \frac{\pi}{2} \cup x \neq k\pi$$

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

نقاط نامطلوب را در دایره
مختصات مشخص میکنیم.

$\cot x$ تعریف نمیشود

$\tan x$ تعریف نمیشود



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