

نام و نام خانوادگی: امیر علی بهرامی / میث تکیف، تابعه و خواص آری / شماره تکلیف: ۳

Subject:

Year: Month: Day: ()

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پاسخ سوال اول:

$$y = \frac{x+3}{(x-1)(2x^2+1x-3)} \rightarrow D_f = \{x \mid x \in \mathbb{R}, x \neq 1, \frac{1}{2}, -3\}$$

الف)

$$y = \frac{x+3}{(x+1)(2x^2+7x+3)} \rightarrow D_f = \{x \mid x \in \mathbb{R}, x \neq -1, -\frac{1}{2}, -3\}$$

پاسخ سوال دوم:

$$y = \frac{x+3}{(x-1)(x^2-x+1)} \rightarrow D_f = \{x \mid x \in \mathbb{R}, x \neq 1\}$$

الف)

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

ب)

$$D_f = \cancel{(-\infty, -3]} \cup (1, \infty)$$

پاسخ سوال سوم:

$$x^2 - 2|x-1| - 2x + 1 \neq 0$$

✓ ق ۱ $\rightarrow x \geq 1 \rightarrow x^2 - 4x + 1 = 0 \rightarrow x = 2, \dots$

✓ ق ۲ $\rightarrow x < 1 \rightarrow x^2 + 3x = 0 \rightarrow x = 0, -3$

$$D_f = \{x \mid x \in \mathbb{R}, x \neq 2, -3, 0\}$$

پاسخ سوال چهارم:

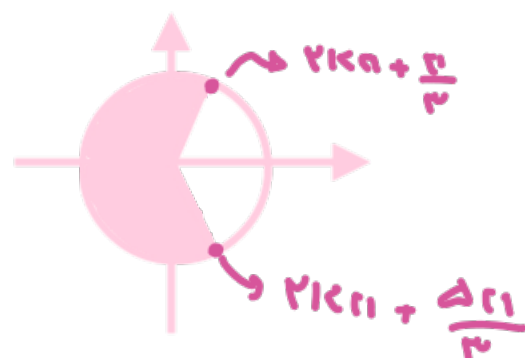
$$y = \sqrt{[-x] - 2} \rightarrow [-x] - 2 \geq 0 \rightarrow -x \geq 2 \rightarrow x \leq -2$$

الف)

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

PAYCO

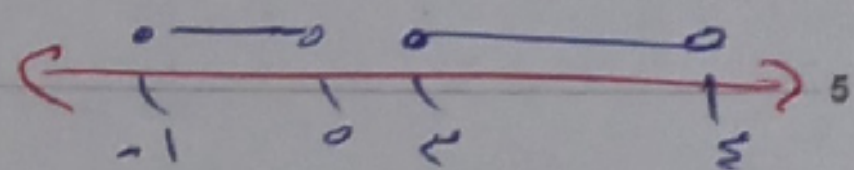
ب-۱ $1 - 2c \sin \theta \geq 0 \rightarrow c \sin \theta \leq \frac{1}{2}$



$\rightarrow D_f = [c \cos \theta + \frac{\pi}{3}, c \sin \theta + \frac{\pi}{3}]$

$$\begin{aligned} [x]^2 - 2[x] - 3 &\neq 0 \rightarrow [x] = + \\ \rightarrow x^2 - 2x - 3 &= 0 \rightarrow x \neq -1, 3 \\ \rightarrow [x] = -1 &\rightarrow -1 \leq x < 0 \quad \text{و} \quad [x] = 3 \rightarrow 3 \leq x < 4 \end{aligned}$$

$$D_f = (-\infty, -1) \cup [0, 3) \cup [4, +\infty)$$



پاسخ سوال پنجم:

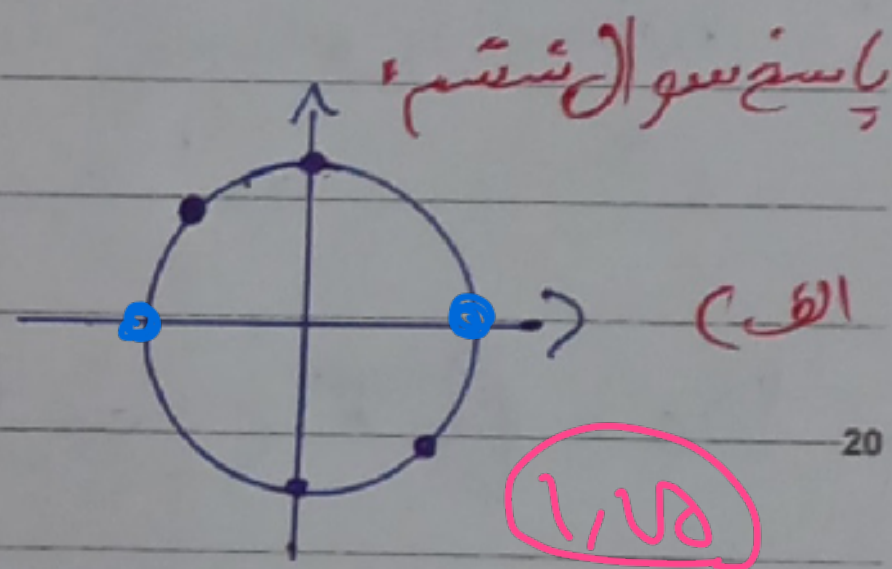
$$\begin{aligned} [x - \frac{1}{x}] + [x + \frac{1}{x}] &\geq 0 \rightarrow 2[x + \frac{1}{x}] \geq 1 \\ [x + \frac{1}{x}] &\geq \frac{1}{2} \rightarrow [x + \frac{1}{x}] \geq 1 \rightarrow x + \frac{1}{x} \geq 1 \\ x &\geq \frac{1}{x} \rightarrow D_f = [\frac{1}{x}, +\infty) \end{aligned}$$

$$\begin{aligned} [x - \frac{1}{x}] + [- (x - \frac{1}{x})] &\geq 0 \rightarrow \begin{cases} x \in \mathbb{Z} + \frac{1}{x} & y = 0 \checkmark \\ x \notin \mathbb{Z} + \frac{1}{x} & y = -1 \checkmark \end{cases} \\ D_f = \{x \mid k \in \mathbb{Z} + \frac{1}{x}, x \neq k\} \end{aligned}$$

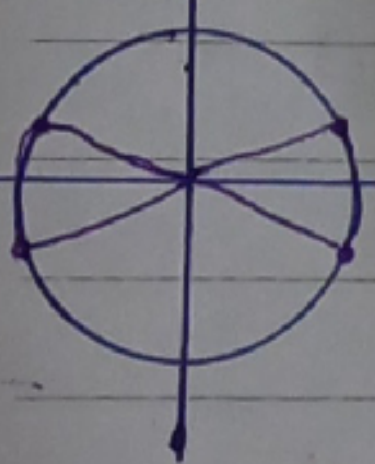
Cotn با این تعریف شود $n \neq k\pi$

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

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



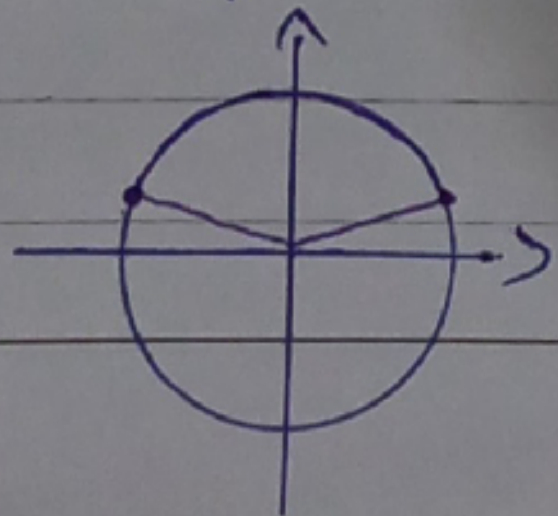
$$1 - \sqrt{2} \sin x \geq 0 \rightarrow \sin x \leq \frac{1}{\sqrt{2}} \rightarrow -\frac{1}{\sqrt{2}} \leq \sin x \leq \frac{1}{\sqrt{2}}$$



$$D_f = \left[2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4} \right] \cup \left[2k\pi + \frac{5\pi}{4}, 2k\pi + \frac{7\pi}{4} \right]$$

پاسخ سوال هفتم:

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



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

$$A - \text{الف} - 1 \leq x^2 + 3x + 1 \leq 1 \rightarrow -1 \leq x^2 + 3x + \frac{9}{4} - \frac{9}{4} \leq 1$$

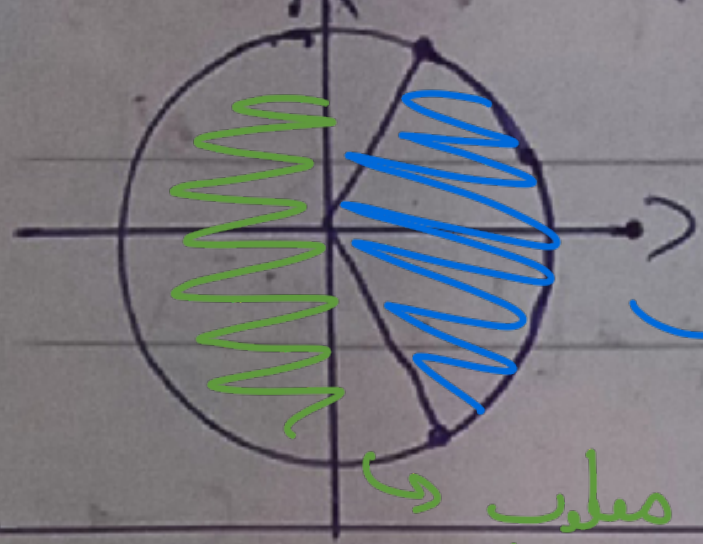
$$\frac{1}{2} \leq x^2 + 3x + \frac{9}{4} \leq \frac{9}{4} \rightarrow \frac{1}{2} \leq \left(x + \frac{3}{2}\right)^2 \leq \frac{9}{4}$$

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

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

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

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



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

در این بازه $\cos x \geq \frac{1}{2}$ است در خارج از آن $\cos x \leq \frac{1}{2}$ است

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

پایه سوال هشتم

$$-1 \leq x^2 + 3x + 1 \leq 1 \rightarrow 1 \leq (x+3)^2 \leq 9$$

$$\rightarrow \sqrt{1} \leq x+3 \leq \sqrt{9} \rightarrow \sqrt{1} - 3 \leq x \leq 0$$

$$\rightarrow -\sqrt{1} \leq x+3 \leq -\sqrt{9} \rightarrow -1 - 3 \leq x \leq -6$$

غریب سوال ۳ است!

$$(n+3)^2 = n^2 + 6n + 9$$

$$-1 \leq \sqrt{x^2 - 2x} \leq 1 \rightarrow 0 \leq \sqrt{x^2 - 2x} \leq 1$$

$$0 \leq x^2 - 2x \leq 1 \rightarrow -2 \leq -2x \leq 1$$

$$2 \leq x \leq \frac{1}{2} \rightarrow D_f = [2, \frac{1}{2}]$$

پایه سوال نهم

$$y = \log_2 (1 - \log_3 x)$$

$$1 - \log_3 x > 0 \rightarrow \log_3 x < 1 \rightarrow 0 < x < 3$$

$$D_f = (0, 3)$$

ب ۱/۵

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

$$D_f = (0, \frac{1}{2})$$

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

$$y = \log_2 (1 - \log_{\frac{1}{2}} x)^n \rightarrow \log_{\frac{1}{2}} x \rightarrow n$$

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

$$D_f = (\frac{1}{2}, +\infty)$$

پاسخ سوال (قسم):

$$2x^2 - 5x + 3 = 0 \rightarrow 2x^2 - 5x + 3 = 0$$

$$2x^2 - 5x + 3 \geq 0 \rightarrow x^2 - 5x + 3 \leq 0 \quad D_f = [1, 3]$$

(ب)

$$2x \in \mathbb{Z} \rightarrow x \in \frac{\mathbb{Z}}{2}$$

$$2x \in \mathbb{Z}$$

$$2x - 2x \in \mathbb{Z} \rightarrow x \in \frac{\mathbb{Z}}{2}$$

$$D_f = \left\{ x = \frac{2k-1}{2}, k \in \mathbb{Z} \right\}$$

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

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

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

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

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

$\tan x$ تعریف نمیشود

نقاط نامعلوم را در دایره مشخص می‌کنیم.

$\cot x$ تعریف نمیشود

$\tan x$ برابر است با 0 (مخرج صفر می‌شود)

