

۲۰

مسئله حاضر دو از دستم تجربی سه شنبه ما

سوال ←
$$\begin{cases} y_1'' = 2x^2 + 2x - 1 \\ y_2'' = 2x^2 + 2x - 1 \end{cases} \xrightarrow{\text{ریاضی}} y_1''' - 2x^2 = 2x - 1 \text{ (اند)}$$

$y_1''' = y_2''' \rightarrow y_1 = y_2$ تابع باشد

ب) $x \cos y = y \cos x \xrightarrow{x=\frac{\pi}{2}} \frac{\pi}{2} \cos y = y \cos \frac{\pi}{2} \Rightarrow \cos y = 0$

$y = k\pi + \frac{\pi}{2}$
تابع نمی باشد ✓

ج) $x y^2 + 2x - y^3 - 2y \rightarrow x y^2 + 2x = y^3 + 2y$

$x(y^2 + 2) = y(y^2 + 2)$

تعداد مشترک
 $x = y$ تابع است ✓

ج) $\frac{x+y}{2} = \sqrt{xy} \rightarrow x+y = 2\sqrt{xy} \rightarrow x+y - 2\sqrt{xy} = 0$

$\rightarrow (\sqrt{x} - \sqrt{y})^2 = 0 \rightarrow \sqrt{x} = \sqrt{y}$
تابع است ✓

سوال ← $|y| + x^2 = 2y$ تابع است

$x^2 = 2y - |y| \xrightarrow{y \geq 0} 2y - y = x^2 \sim x^2 = y$

$2y - |y| \geq 0$

$|y| \leq 2y$

$-2y \leq y \leq 2y \quad 0 \leq y \leq 2y$

Scanned with

$$[y] + [x] = 1$$

$$x=2 \leadsto [y] + 2 = 1 \rightarrow [y] = -1 \rightarrow -2 \leq y \leq -1$$

← تابع غیر یکنواخت ✓

$$f(x) = \begin{cases} 2x^2 - b & |x-1| \geq 2 \\ a+2x & 0 \leq x \leq 2 \end{cases}$$

سوال ۳ ← (r)

$$\Rightarrow x=2 \rightarrow 1 \wedge -b = a+4$$

$$\hookrightarrow 1 \wedge -b = 4+a \rightarrow a+b = -1 \checkmark$$

$$f(x) = \sqrt{a-bx-x^2} \rightarrow -(x^2+bx-a)$$

$$\rightarrow -(x-b)(x-a)$$

$$-(x^2 - (b+a)x + ab)$$

سوال ۴ ← (r)

$b=a$
 $-a=a \rightarrow b=-1 \checkmark$

$-b-a = +b$
 $+1-a = -1$
 $a=2 \checkmark$

$$\hookrightarrow a+b = -1+2 = 1 \checkmark$$

$$y = \frac{2}{\sqrt{ax^2+bx+c}} \rightarrow a \neq 0$$

سوال ۵ ← (r)

$$bx+c > 0 \rightarrow x > -\frac{c}{b} \rightarrow -\frac{c}{b} = 2$$

$$ra+c = -b$$

$$\hookrightarrow rb - rb = -b \rightarrow b = -1 \checkmark$$

$$\hookrightarrow c = -2b \checkmark$$

$$y = \sqrt{\frac{rx+r}{x+b} + a}$$

سوال ۶ ← (r)

$$\frac{rx+r}{x+b} + a = 1 \rightarrow \frac{r+x}{x+b} = a$$

$$\hookrightarrow \frac{rx+r+a(x+b)}{x+b} \rightarrow \frac{r(x+a)+r+ab}{x+b}$$

$a+r=0$
 $\hookrightarrow a=-r \checkmark$
 $x+b=0$
 $b=-1 \checkmark$

$$\sqrt{x(x-1)(x+1)}$$

$$\frac{1}{-1} + \frac{0}{-1} + \frac{1}{-1} + 1 \rightarrow$$

سوال (۲) $\rightarrow$ $D_f = [-1, 0] \cup [1, +\infty)$ ✓

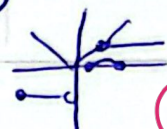
ب) $\frac{1}{\sqrt{|x|-1}}$

$$\rightarrow |x|-1 > 0 \rightarrow |x| > 1 \rightarrow x > 1 \text{ یا } x < -1$$

$$(-\infty, -1) \cup (1, +\infty)$$
 ✓

سوال ۱) $y = \sqrt{\frac{1}{|x| - [x]}}$ $\rightarrow |x| - [x] \neq 0 \rightarrow |x| \neq [x] \leftarrow$

$$R - W$$
 ✓



ب) $\sqrt{x} + \sqrt{y} = 9 \rightarrow 9 - \sqrt{x} = \sqrt{y} \rightarrow x + 81 - 18\sqrt{x} = y$

y مثبت است پس $x \geq 0$ $\leftarrow$ $[0, 81]$ ✓

$$y = \frac{1}{\sqrt{[2x - \frac{1}{2}] + [2x + \frac{1}{2}]}}$$

سوال (۲) $\leftarrow$

$$[2x - \frac{1}{2}] + [2x + \frac{1}{2}] + 2 > 0 \rightarrow 2[2x - \frac{1}{2}] > -2$$

$$[2x - \frac{1}{2}] > -1 \rightarrow 0 \leq 2x - \frac{1}{2}$$

$$\frac{1}{2} \leq 2x \rightarrow \frac{1}{4} \leq x$$

$$D_f = [\frac{1}{4}, +\infty)$$
 ✓

سوال $y = \sqrt{1 - \log(2x-a)} \rightarrow ① 2x-a > 0 \rightarrow 2x > a \rightarrow x > \frac{a}{2}$

② $1 - \log(2x-a) \geq 0 \rightarrow 1 \geq \log(2x-a)$ (۲)

$$\rightarrow 10 \geq 2x-a \rightarrow 10+a \geq 2x \rightarrow \frac{10+a}{2} \geq x$$

$$\rightarrow \frac{a}{2} \leq x < \frac{10+a}{2} \rightarrow \frac{10+a}{2} = c$$

$$\frac{a}{2} = b$$

$$c-b = \frac{10}{2} = 5$$
 ✓