

19, 75

تکلیف اول باران شریفی کلاس 5

$$y^3 - 2x^2 = 2x - 1$$

$$x_1 = x_2$$

$$y_1^3 - 2x_1^2 = 2x_1 - 1$$

$$y_2^3 - 2x_2^2 = 2x_2 - 1$$

$$\Rightarrow y_1^3 = y_2^3 \Rightarrow y_1 = y_2 = 0$$

سوال 1: (2)

$$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) = 0$$

$$\Rightarrow y_1 = y_2 \quad (y_1 + \frac{y_2}{2})^2 + \frac{3}{4} y_2^2 = 0$$

$$\Rightarrow y_1 = y_2 = 0$$

تابع است

✓

$$10) x \cos y = y \cos x$$

$$x = \frac{\pi}{2} \Rightarrow \cos y = 0 \Rightarrow y = (k\pi + \frac{\pi}{2})$$

تابع نیست ✓

$$15) \frac{x+y}{2} = \sqrt{xy} \quad x, y > 0$$

$$x+y-2\sqrt{xy} = 0 \Rightarrow (\sqrt{x}-\sqrt{y})^2 = 0 \Rightarrow x=y \Rightarrow \text{تابع است} \checkmark$$

$$20) xy^2 + 2x - y^2 - 2y = 0$$

$$x(y^2+2) - y(y^2+2) = 0 \Rightarrow (x-y)(y^2+2) = 0$$

$$+0/0 \Rightarrow x=y$$

$$x=y$$

تابع است ✓

$$25) |y| + x^2 = 2y$$

$$y + x^2 = 2y \quad y > 0$$

$$x^2 = y \quad y < 0$$

$$x^2 = y \Rightarrow \sqrt{y}$$

$$\Rightarrow y = \frac{x^2}{2} \Rightarrow \text{تابع است} \checkmark$$

سوال 2: (2)

تابع است ✓

$$30) [y] + [x] = 1$$

$$\Rightarrow x=0 \quad [y]=1$$

$$\Rightarrow y = [1, 2) \Rightarrow \text{تابع نیست} \checkmark$$

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سوال ۳

$$f(x) = \begin{cases} 2x^2 - b & |x-1| \geq 2 \\ a+2x & 0 \leq x \leq 3 \end{cases} \rightarrow \begin{cases} 2x^2 - b & x \geq 3 \\ a+2x & 0 \leq x \leq 3 \\ 2x^2 - b & x \leq -1 \end{cases}$$

(۲)

$$x=3 \rightarrow 2x^2 - b = a+2x \rightarrow 12 = a+b \checkmark$$

$$f(x) = \sqrt{a-bx-x^2}, D=[b,a] \quad a+b=? \quad a \neq 0 \quad b \in \mathbb{Z}$$

$$\begin{aligned} x=a &\rightarrow a-ba-a^2=0 \\ x=b &\rightarrow a-b^2-b^2=0 \end{aligned} \rightarrow \begin{cases} a(1-b-a)=0 \\ a-b^2=0 \end{cases}$$

(۲)

$$\begin{aligned} \textcircled{x} &\rightarrow -b+1-2b^2=0 \\ &\rightarrow -b^2-b+1=0 \quad \textcircled{b} \rightarrow b=-1 \checkmark \rightarrow a=1-(-1)=2 \checkmark \\ &\quad b=\frac{1}{2} \rightarrow a=1-\frac{1}{4}=\frac{3}{4} \end{aligned}$$

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

$$y = \frac{2}{\sqrt{ax^2+bx+c}} \quad D=(-\infty, 2)$$

سوال ۴

$$\begin{aligned} \sqrt{ax^2+bx+c} &\quad x=2 \\ b \cdot 2 + c &= 2b + c = 0 \checkmark \\ a &= 0 \end{aligned}$$

(۲)

$$c = -2b \checkmark$$

$$3a+c-3(-b)=? \rightarrow -2b+3b=b \checkmark$$

$$y = \sqrt{\frac{2x+2}{x+b}} + a \quad D=(2, +\infty) \quad b=7$$

سوال ۵

$$\begin{aligned} 2+b &= 0 \\ b &= -2 \checkmark \end{aligned}$$

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

(۲)

$$D = [-1, 0] \cup [1, +\infty)$$

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$$y = \frac{1}{\sqrt{|x|-1}}$$

$$|x| > 1$$

$$x < -1$$

$$x > 1$$

$$D = (-\infty, -1) \cup (1, +\infty) \checkmark$$

$$y = \sqrt[3]{\frac{1}{|x|-[x]}}$$

$$|x| - [x] \neq 0$$

فقط اعداد منتهية

$$R - \mathbb{N} = D \checkmark$$

سوال 1

(2)

$$\rightarrow \sqrt{x} + \sqrt{2} = 9 \quad x \geq 0 \quad 2 \geq 0$$

$$\sqrt{2} = 9 - \sqrt{x}$$

$$9 - \sqrt{x} \geq 0 \rightarrow 1 \geq x \quad D = 0 \leq x \leq 1 \checkmark$$

سوال 9

$$y = \frac{1}{\sqrt{\left[2x - \frac{1}{x}\right] + \left[2x + \frac{3}{x}\right]}}$$

$$\left[2x - \frac{1}{x} + 1 + 1\right] + \left[2x + \frac{3}{x}\right] \geq 0$$

$$2\left[2x + \frac{3}{x}\right] - 1 \geq 0$$

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

$$2x + \frac{3}{x} \geq +1 \quad \text{وقت}$$

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

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

(1, 1/2)

$$y = \sqrt{1 - \log_2(2x - a)}$$

$$D = (b, c]$$

سوال 10

$$1 - \log_2(2x - a) \geq 0$$

$$x = c$$

$$c - b = ?$$

$$x = b$$

(2)

$$\log_{10} 2x - a \leq 1$$

$$2x - a \leq 10$$

$$2c - a \leq 10 \rightarrow c \leq \frac{10 + a}{2}$$

$$2b - a = 0 \rightarrow b = \frac{a}{2}$$

$$c - b = \frac{10 + a}{2} - \frac{a}{2} = 5 \checkmark$$