

سوال ١

$$0 = (3 + w)(b - w) \Leftrightarrow 0 = b^2 - w^2 - 3w \rightarrow w^2 + 3w - b^2 = 0 \quad (\text{الف})$$

$$\begin{aligned} 0 &= (1 + w)(b - w) \Leftrightarrow 0 = b^2 - w^2 - w \\ &= \frac{b^2}{1} - \frac{w^2}{1} - \frac{w}{1} \\ &= \frac{b^2}{1} - \frac{w^2}{1} - \frac{w}{1} \end{aligned}$$

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$$0 = (1 + w)(b - w) \Leftrightarrow 0 = b^2 - w^2 - w$$

$$\begin{aligned} 3 &= \frac{1}{w} \rightarrow w \rightarrow \frac{1}{w} \\ &= \frac{1}{w} \rightarrow w \rightarrow \frac{1}{w} \end{aligned}$$

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$$A = \{1, 2, 3\} \quad B = \{2, 3\}$$

$$A \times B = \{(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\}$$

$$B^r = B \times B = \{(2, 2), (2, 3), (3, 2), (3, 3)\}$$

$$A \times B - B^r = \{(1, 2), (1, 3)\}$$

سوال ۳

$$f(n) = \left\{ \overline{(3, m^r)}, \overline{(2, 1)}, \overline{(-3, m)}, \overline{(-2, m)}, \overline{(3, m+2)}, \overline{(2, m+2)} \right\}$$

$$m^r = m + 2 \Rightarrow m^r - m - 2 = 0 \Rightarrow m \rightarrow -\frac{c}{a} = -\frac{2}{1} = -2$$

اگر m و $m+2$ را به هم اضافه کنیم، نتیجه -2 می‌شود.

$$f(n) = \left\{ \overline{(3, m^r)}, \overline{(2, 1)}, \overline{(m, 2)}, \overline{(3, m+2)}, \overline{(-2, m)}, \overline{(-1, 3)} \right\}$$

$$m^r = m + 2 \Rightarrow m \rightarrow$$

اگر m و $m+2$ را به هم اضافه کنیم، نتیجه -2 می‌شود.
 * نتیجه می‌گیریم که $m = -2$.

$$\overline{(2, 1)}, \overline{(3, 1)}, \overline{(-1, 3)}, \overline{(-2, 3)}$$

به ازای m هیچ مقدار از m

سوال ۵

$$f(n) = \left\{ \overline{(1, a^r)}, \overline{(1, 3a-2)}, \overline{(a^r, 3a+2)} \right\}$$

$$a^r = 3a - 2 \Rightarrow a^r - 3a + 2 = 0 \rightarrow a \rightarrow \frac{c}{a} = \frac{2}{1} = 2$$

سوال ۷

$$f(m) = \begin{cases} m^3 - 1 & m \leq 1 \\ am + b & 1 < m \leq 2 \\ m^3 & m > 2 \end{cases}$$

در صورت اول و دوم
تکرار دارد

$$\begin{aligned} 1 - 1 &= a + b \\ \Rightarrow -a &= +b \\ \Rightarrow a &= -b \end{aligned}$$

$$a = 2 \Rightarrow b = -2$$

$$\Rightarrow a \times b = 2 \times (-2) = -4$$

سوال ۷

$$f(m) = \begin{cases} 2m - 3 & m > k \\ 4 - 3m & m \leq k \end{cases}$$

$$\Rightarrow 2k - 3 = 4 - 3k \Rightarrow 5k = 7 \Rightarrow k = \frac{7}{5}$$

سوال ۸

$$y^3 - 4y = m^2 - 4m + 3 \Rightarrow y^3 - 4y_1 = m_1^2 - 4m_1 + 3$$

$$y^3 - 4y_1 = (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2) - 4(y_1 - y_2) = (y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 - 4)$$

$$(y_1 - y_2) \left[(y_1^2 + y_1 y_2 + y_2^2 - 4) \right] = 0 \Rightarrow \Delta = 0$$

$$|m| + |y| = 3 \Rightarrow m = 0 \Rightarrow y = -3$$

تابع نیست

$$|y| = \sqrt{1 - \cos m} \Rightarrow m = \frac{\pi}{2} \Rightarrow \cos \frac{\pi}{2} = 0 \Rightarrow y = 1$$

تابع نیست

تابع است

$$y^2 + m^2 + 2m + 1 = 0 \Rightarrow y = 0$$

خبر نیست

سوال ۹

$$\sqrt[3]{y} + m^2 = 2m - 2 \Rightarrow \sqrt[3]{y_1} = -m_1^2 + 2m_1 - 2$$

$$\sqrt[3]{y_2} = -m_2^2 + 2m_2 - 2 \Rightarrow y_1 = y_2$$

$$y_1^3 + 2y_1 = 5m_1^2 \Rightarrow m_1^2 = \frac{y_1^3 + 2y_1}{5}$$

$$y_2^3 + 2y_2 = 5m_2^2 \Rightarrow m_2^2 = \frac{y_2^3 + 2y_2}{5}$$

$$y_1^3 - y_2^3 + (y_1 - y_2) = 5(m_1^2 - m_2^2) = 5(m_1 - m_2)(m_1 + m_2)$$

$$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2) = 5(m_1 - m_2)(m_1 + m_2)$$

$$y_1 - y_2 = 0 \Rightarrow y_1 = y_2$$

$$(y_1^2 + y_2^2 + y_1 y_2 + 2) = 0 \Rightarrow y_1 = y_2 = -1$$

تابع است

$$a) \quad m \sin y = y \sin x$$

$$m = 0 \quad \sin 0 = 0$$

$$y = 1 \quad x = 1$$

$$b) \quad \sqrt{\frac{m}{y}} + \sqrt{\frac{y}{m}}$$

$$= 2 \Rightarrow \frac{\sqrt{m}}{\sqrt{y}} + \frac{\sqrt{y}}{\sqrt{m}} = 2 \Rightarrow \frac{m+y}{\sqrt{m}\sqrt{y}} = 2$$

$$m+y = 2\sqrt{m}\sqrt{y} \Rightarrow \frac{m}{\sqrt{m}\sqrt{y}} = \frac{\sqrt{y}}{\sqrt{m}} \Rightarrow \frac{m_1}{y_1} = \frac{\sqrt{y_1}}{\sqrt{y_2}} = \frac{\sqrt{y_1}}{y_1} \cdot \frac{y_1}{y_2} = \frac{y_1}{y_2}$$

$$\frac{y_2}{y_1} = \frac{y_1}{y_2} \Rightarrow \frac{1}{y_2} = \frac{1}{y_1}$$

$$\Rightarrow y_1 = y_2$$

تلف است