

۲. آزمون ضمیمه خوب نوشته بدو ن

الف) $2x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x - 34 = 0 \rightarrow (x+4)(x-9) = 0 \rightarrow \begin{cases} x = -4 \\ x = 9 \end{cases}$

ب) $3x^2 - 11x - 4 = 0 \rightarrow x^2 - 11x - 4 = 0 \rightarrow (x+1)(x-9) = 0 \rightarrow \begin{cases} x = -1 \\ x = 9 \end{cases}$

ج) $4x^2 - 4x - 3 = 0 \rightarrow x^2 - 4x - 12 = 0 \rightarrow (x+2)(x-6) = 0 \rightarrow \begin{cases} x = -2 \\ x = 6 \end{cases}$

د) $2x^2 - 5x - 12 = 0 \rightarrow x^2 - 5x - 24 = 0 \rightarrow (x+3)(x-8) = 0 \rightarrow \begin{cases} x = -3 \\ x = 8 \end{cases}$

الف) $x^2 - 5x - 14 = 0 \rightarrow (x+2)(x-7) = 0 \rightarrow \begin{cases} x = -2 \\ x = 7 \end{cases}$

ب) $2x^2 + 5x + 3 = 0 \rightarrow x^2 + 5x + 4 = 0 \rightarrow (x+1)(x+4) = 0 \rightarrow \begin{cases} x = -1 \\ x = -4 \end{cases}$

ج) $x^2 + 2x + 3 = 0 \rightarrow x = \frac{-2 \pm \sqrt{4-12}}{2} \Rightarrow \Delta < 0$ ریشه ندارد

د) $3x^2 + 13x - 2 = 0 \rightarrow x = \frac{-13 \pm \sqrt{169+24}}{6} \Rightarrow x = \frac{-13 \pm \sqrt{193}}{6}$

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

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

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

$\ominus \Rightarrow \{(1,2) \text{ و } (1,3)\}$

الف) $f(x) = \{(3, m^2), (2, 1), (-3, m), (-2, m), (3, m+2), (m, 4)\}$

$\star: m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \Rightarrow (m+1)(m-2) = 0 \rightarrow \begin{cases} m = -1 \\ m = 2 \end{cases}$

$m = -1 \rightarrow f(x) = \{(2, 1), (2, 1), (-3, -1), (-2, -1), (3, 1), (-1, 4)\}$ غلط

$m = 2 \rightarrow f(x) = \{(3, 4), (2, 1), (-3, 2), (-2, 2), (3, 4), (2, 4)\}$ غلط

ب) $f(x) = \{(3, m^2), (2, 1), (m, 4), (3, m+2), (2, m), (-1, 3)\}$

$\star: m^2 = m+2 \rightarrow (m+1)(m-2) = 0 \rightarrow \begin{cases} m = -1 \\ m = 2 \end{cases}$

$m = -1 \rightarrow f(x) = \{(2, 1), (2, 1), (-1, 4), (2, 1), (-2, -1), (-1, 3)\} / m = 2 \rightarrow f(x) = \{(3, 4), (2, 1), (2, 3), (3, 4), (-2, 2), (-1, 3)\}$

$f(x) = \{(1, a^2), (1, 3a-2), (a^2, 3a+2)\}$

$a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 = 0 \rightarrow (a-1)(a-2) = 0 \rightarrow \begin{cases} a = 1 \\ a = 2 \end{cases}$

$a = 1 \rightarrow f(x) = \{(1, 1), (1, 1), (1, 5)\}$ غلط

$a = 2 \rightarrow f(x) = \{(1, 4), (1, 4), (4, 8)\}$ غلط

$$f(x) = \begin{cases} x^2 - 1 & x \leq 1 \quad * \\ ax + b & 1 \leq x \leq 2 \quad \circ \\ x^2 & x \geq 2 \quad \Delta \end{cases}$$

$$\textcircled{1}: x=1 \xrightarrow{* \circ} 0 = a + b \rightarrow -a = b$$

$$\textcircled{2}: x=2 \xrightarrow{\circ \Delta} 2a + b = 1 \xrightarrow{\textcircled{1}} 2a - a = 1$$

$$a = 1$$

$$a + b = -1 \times 1 = -1 \quad \text{رف}$$

$$b = -1$$

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$$f(x) = \begin{cases} 2x - 3 & x \geq k \quad * \\ f - 3x & x \leq k \quad \circ \end{cases}$$

$$x=k \xrightarrow{* \circ} \Rightarrow 2x - 3 = f - 3x$$

$$5x = 3$$

$$x = \frac{3}{5} \Rightarrow k = \frac{3}{5}$$

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$$\text{الف) } y'' + y = x^2 - 4x + 3 \rightarrow y'' - y'' = \text{تابع نیست}$$

$$\Rightarrow |x| + |y| = 3 \xrightarrow{x=1} |y| = 2 \rightarrow y = \pm 2 \quad \text{تابع نیست}$$

$$\text{ج) } |y| = \sqrt{1 - \cos x} \xrightarrow{x=\frac{\pi}{2}} |y| = \sqrt{1 - 0} = |y| = 1 \rightarrow y = \pm 1 \quad \text{تابع نیست}$$

$$\Rightarrow y'' + x^2 + 2x + 1 = 0 \rightarrow y'' + (x+1)^2 = 0 \rightarrow y=0 \quad \text{تابع است}$$

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$$\text{الف) } \sqrt[3]{y} + x^2 = 2x + 2 \rightarrow \sqrt[3]{y} = -x^2 + 2x + 2 \rightarrow \begin{cases} \sqrt[3]{y_1} = -x^2 + 2x + 2 \\ \sqrt[3]{y_2} = -x^2 + 2x + 2 \end{cases}$$

$$\Rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2 \quad \text{تابع است}$$

$$\Rightarrow y'' + 2y = \omega x \rightarrow \begin{cases} y_1'' + 2y_1 = \omega x \\ y_2'' + 2y_2 = \omega x \end{cases} \Rightarrow y_1'' + 2y_1 = y_2'' + 2y_2 \rightarrow y_1'' - y_2'' = 2(y_2 - y_1) \rightarrow \frac{-2(y_1 - y_2)}{2y_2 - 2y_1}$$

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

$$\begin{cases} y_1 = y_2 \\ y_1'' + y_2'' + y_1' + y_2' + 2 = 0 \end{cases} \rightarrow \Delta = y_1'' - 4y_2'' - 1 \rightarrow -4y_2'' - 1 \rightarrow \Delta \neq 0 \quad \text{تابع است}$$

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$$\text{الف) } x \sin y = y \sin x \xrightarrow{x=0} 0 = 0 \rightarrow \text{مقدار از صفر می گذرد}$$

پس تابع نیست

$$\Rightarrow \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \xrightarrow{\sqrt{\frac{x}{y}} = \frac{1}{a}} a + \frac{1}{a} = 2 \xrightarrow{x^4} a^2 - 2a + 1 = 0 \rightarrow (a-1)^2 = 0 \rightarrow a = 1$$

$$\rightarrow \frac{x}{y} = 1 \rightarrow x = y \quad \text{تابع است}$$

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$$(10-ب) \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$$

این عبارت تنها زمانی برقرار است که $1 = \sqrt{\frac{x}{y}}$ باشد پس

$$\sqrt{\frac{x}{y}} = 1 \leadsto \frac{x}{y} = 1 \leadsto x = y \text{ و } (x, y \neq 0)$$

