

مؤال باقدي / ياردهم دختد / تليف سماره ١ ٢٠ آئين ضيف دمل نوستر!

(1) الف $\left. \begin{array}{l} x^2 - 5x - 4 = 0 \\ x^2 - 5x - 14 = 0 \end{array} \right\} \begin{array}{l} x_1 = 1, 5 \\ x_2 = -2, 14 \end{array}$

$(x-9)(x+4) = 0$
 $\frac{9}{4} \leftarrow \frac{-4}{4}$

(ب) $\left. \begin{array}{l} x^2 - 11x - 12 = 0 \\ x^2 - 11x - 9 = 0 \end{array} \right\} \begin{array}{l} x_1 = 12 \\ x_2 = -1, 9 \end{array}$

$(x-9)(x+1) = 0$
 $\frac{9}{1} \leftarrow \frac{-1}{1}$

(2) $\left. \begin{array}{l} x^2 - 7x - 12 = 0 \\ x^2 - 7x - 18 = 0 \end{array} \right\} \begin{array}{l} x_1 = 12, 1 \\ x_2 = -1, 18 \end{array}$

$(x-9)(x+2) = 0$
 $\frac{9}{2} \leftarrow \frac{-2}{2}$

(3) $\left. \begin{array}{l} x^2 - 5x - 12 = 0 \\ x^2 - 5x - 24 = 0 \end{array} \right\} \begin{array}{l} x_1 = 12 \\ x_2 = -3, -16 \end{array}$

$(x-11)(x+3) = 0$
 $\frac{11}{3} \leftarrow \frac{-3}{3}$

(4) الف $x^2 - 5x - 14 = (x-9)(x+4) = 0 \Rightarrow x_1 = 9, x_2 = -4$

(ب) $\left. \begin{array}{l} x^2 + 5x + 4 = 0 \\ x^2 + 5x + 9 = 0 \end{array} \right\} \begin{array}{l} (x+2)(x+4) = 0 \\ x_1 = -2, x_2 = -4 \end{array}$

$\frac{-2}{1} \leftarrow \frac{-4}{1}$

$x^2 + 2x + 3 = 0 \Rightarrow \Delta = b^2 - 4ac = 4 - 12 = -8$

$\Delta < 0 \Rightarrow$ رسته ندارد

(3) $\Delta = 9 - 4(-2)(3) = 33 \Rightarrow x_1 = \frac{-3 + \sqrt{33}}{4}, x_2 = \frac{-3 - \sqrt{33}}{4}$

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

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

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

3

4

$$(3, m^2)(3, m+2) \Rightarrow m^2 = m+2 \Rightarrow m = 2, -1$$

$$\text{if } m=2 \quad f(x) = \{(3, 4)(2, 1)(-3, 2)(-2, 2)(3, 4)(2, 4)\}$$

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$$\text{if } m=-1 \quad f(x) = \{(3, 1)(2, 1)(-3, -1)(-2, -1)(3, 1)(-1, 4)\}$$

$$\Rightarrow m = -1$$

$$m^2 = m+2 \Rightarrow m = 2, -1$$

(ب) برای هیچ مقادیری

$$\text{if } m=2 \quad \{(3, 4)(2, 1)(2, 4)(3, 4)(-2, 2)(-1, 3)\} \Rightarrow X$$

$$\text{if } m=-1 \quad \{(3, 1)(2, 1)(-1, 4)(3, 1)(-2, -1)(-1, 3)\} \Rightarrow X$$

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$$a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 = 0 \Rightarrow (a-2)(a-1) = 0$$

$$a=2 \quad \{(1, 4)(1, 4)(4, 1)\}$$

$$a=1 \quad \{(1, 1)(1, 1)(1, 5)\}$$

$$\{a=2, 1\}$$

3

4

$$n=1 \Rightarrow (1)^2 - 1 = a+b \Rightarrow a+b=0 \Rightarrow b=-a$$

$$n=2 \Rightarrow 2a+b=1 \Rightarrow 2a-a=1 \Rightarrow a=1 \Rightarrow b=-1$$

$$a \times b = 1 \times -1 = -1$$

3

6

$$f(k) - 3 = k - 3(k) \Rightarrow 2k - 3 = k - 3k$$

$$2k = 3 \Rightarrow k = \frac{3}{2} = 1.5$$

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3

الف) $n=1 \Rightarrow n^2 - kn + 3 = 1 - k + 3 = 0 \times$ تابع نیست (1)

$y^3 - 4y = 0 \Rightarrow y^3 = 4y \Rightarrow y^2 = 4 \Rightarrow y = \pm \sqrt{4}$

ب) $n=1 \Rightarrow |1| + |y| = 3$

$|y| = 2 \Rightarrow y = \pm 2 \rightarrow \times$ تابع نیست (2)

ج) $\cos n = -1 \Rightarrow |y| = \sqrt{2} \Rightarrow y = \pm \sqrt{2} \rightarrow \times$ تابع نیست (3)

د) $y^2 + (n+1)^2 = 0 \quad \begin{matrix} -1 \\ 0 \end{matrix} \rightarrow$ تابع است (4)

الف) $\sqrt[3]{y} + n^2 = 2n - 2 \Rightarrow \sqrt[3]{y} = 2n - 2 - n^2$ تابع است.

$\begin{cases} \sqrt[3]{y_1} = 2n_1 - 2 - n_1^2 \\ \sqrt[3]{y_2} = 2n_2 - 2 - n_2^2 \end{cases} \xrightarrow{n_1 = n_2} \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1 = y_2$

ب) $\begin{cases} y_1^3 + 2y_1 = 2n_1 \\ y_2^3 + 2y_2 = 2n_2 \end{cases} \xrightarrow{n_1 = n_2} y_1^3 + 2y_1 = y_2^3 + 2y_2$

$\rightarrow y_1^3 - y_2^3 = 2y_2 - 2y_1$ (5)

$(y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2) = 2(y_2 - y_1) = -2(y_1 - y_2)$

$(y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2) + 2(y_1 - y_2) = 0$

$(y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 2) = 0$ تابع است.

$\Delta = -3y^2 - 4 \Rightarrow \Delta < 0 \Rightarrow y_1 = y_2$ (6)

الف) $n=0 \rightarrow y$ عدد صحیح $\rightarrow \times$ تابع نیست (7)

ب) $\frac{2}{y} \rightarrow \frac{n}{y} + \frac{y}{n} + 2 = 4 \Rightarrow \frac{n^2 + y^2}{ny} = 2 \Rightarrow n^2 + y^2 - 2ny = 0$

شرط $(n, y \neq 0)$ یادداشت کن

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$(n - y)^2 = 0 \Rightarrow n = y \rightarrow$ تابع است (8)

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

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

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

