

شماره تلفن: 1

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(1) $4x^2 - 5x - 4 = 0 \rightarrow x^2 - 5x - 4 = 0 \rightarrow (x-9)(x+4) = 0$

$$x = \frac{9}{4} = \frac{3}{4}$$

$$x = \frac{-4}{4} = -1$$

ب) $3x^2 - 11x - 3 = 0 \rightarrow x^2 - 11x - 9 = 0 \rightarrow (x-9)(x+1) = 0 \rightarrow x = \frac{9}{1} = 9$
 $x = \frac{-1}{1} = -1$

ج) $4x^2 - 4x - 3 = 0 \rightarrow x^2 - 4x - 12 = 0 \rightarrow (x-6)(x+2) = 0 \rightarrow x = \frac{6}{1} = 6$
 $x = \frac{-2}{1} = -2$

د) $2x^2 - 5x - 12 = 0 \rightarrow x^2 - 5x - 24 = 0 \rightarrow (x-8)(x+3) = 0$
 $x = \frac{8}{1} = 8$
 $x = \frac{-3}{1} = -3$

(2) الف) $x^2 - 5x - 12 = 0 \rightarrow (x-7)(x+2) = 0 \rightarrow x = 7, -2$

ب) $2x^2 + 5x + 3 = 0 \rightarrow x = -1, -\frac{3}{2} \rightarrow$ مع a, b, c

ج) $x^2 + 2x + 3 = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow \Delta = 4 - 4(1)(3) \rightarrow \Delta < 0 \rightarrow$ هیچ ندارد

د) $3x^2 + 2x - 4 = 0 \rightarrow \Delta = 4 - 4(-2)(3) = 32$
 $x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow x = \frac{-2 \pm \sqrt{32}}{6}$

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

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

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

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

$m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow (m-2)(m+1) = 0$
 if $m=2 \rightarrow (2,1)(2,2) \times$ تابع نیست

if $m=-1 \rightarrow (3,1)(2,1)(-3,-1)(3,1)(-1,2) \checkmark$ تابع است

$m = -1$

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

$m^2 = m+2 \rightarrow m^2 - m - 2 = 0 \rightarrow m = 2, -1$
 if $m=2 \rightarrow (2,1)(2,2) \times$ تابع نیست

if $m=-1 \rightarrow (-1,3)(-1,2) \times$ تابع نیست

به ازای هیچ مقدار m

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

$$a^r = 3a - r \rightarrow a^r - 3a + r = 0 \quad a=1, 2, 3 \quad a=2$$

$$f(n) = \begin{cases} n^2-1 & n \leq 1 \\ an+b & 1 \leq n \leq 2 \\ n^3 & n \geq 2 \end{cases} \rightarrow \begin{cases} -a \cdot b = 0 \\ 2a+b = n \\ a = n, b = -n \end{cases} \quad a \cdot b = -96$$

$$f(n) = \begin{cases} 2n-3 & n \geq k \\ 5-3n & n \leq k \end{cases} \quad \begin{aligned} 2k-3 &= 5-3k \\ 5k &= 8 \rightarrow k = \frac{8}{5} \end{aligned}$$

$$(الف) \quad y^3 - 4y = n^2 - 4n + 3 \quad y^3 \oplus y = \text{تابع نیست} \Rightarrow \text{تابع نیست}$$

$$(ب) \quad |n| + |y| = 3 \rightarrow \text{if } n=0 \quad |y|=3 \rightarrow y = \pm 3 \rightarrow \text{تابع نیست}$$

$$(ج) \quad |y| = \sqrt{1 - \cos n} \rightarrow \text{if } n = \frac{\pi}{2} \rightarrow |y| = \sqrt{1-0} \Rightarrow |y| = 1 \rightarrow y = \pm 1 \rightarrow \text{تابع نیست}$$

$$(د) \quad y^2 + n^2 + 2n + 1 = 0 \rightarrow y^2 + (n+1)^2 = 0 \rightarrow |0| \rightarrow \text{تابع است}$$

$$(الف) \quad \sqrt[3]{y} + n^2 = 2n - 2 \rightarrow \sqrt[3]{y_1} + n_1^2 = 2n_1 - 2 \quad \begin{cases} n_1 = n_2 \\ -n_1^2 + 2n_1 - 2 = -n_2^2 + 2n_2 - 2 \end{cases} \Rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2$$

$$(ب) \quad y^3 + y = 2n \rightarrow \begin{cases} y_1^3 + y_1 = 2n_1 \\ y_2^3 + y_2 = 2n_2 \end{cases} \xrightarrow{n_1 = n_2} y_1^3 + y_1 = y_2^3 + y_2$$

$$y_1^3 - y_2^3 = 2(y_2 - y_1)$$

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

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

$$\downarrow \quad y_1 = y_2$$

$$\rightarrow -y_2 \pm \sqrt{y_2^2 - 4(y_2^2 + 2)} \rightarrow \Delta = y_2^2 - 4y_2^2 - 8$$

$$\Delta = -3y_2^2 - 8 \rightarrow \Delta < 0$$

$$(الف) \quad n \sin y = y \sin n \xrightarrow{\text{if } n=0} 0 \times \sin y = y \times 0 \rightarrow \text{تابع است}$$

$$(ب) \quad \sqrt{\frac{n}{y}} + \sqrt{\frac{y}{n}} = 2 \quad n=y, (n, y \neq 0) \rightarrow \text{تابع است}$$