

الف)  $x^2 - 9x - 9 = 0$   $x^2 - 9x - 36 = 0$   $(x-9)(x+4) = 0$

$x = 9$   $x = -4$

ب)  $x^2 - 11x - 3 = 0 \rightarrow x^2 - 11x - 9 = 0$

$(x-9)(x+1) = 0$   $x = 9$   $x = -1$

$x = 9$   $x = -\frac{4}{3} = -\frac{1}{3}$

ج)  $x^2 - 4x - 3 = 0$   $x^2 - 4x - 12 = 0$   $(x-6)(x+2) = 0$   $x = 6$   $x = -2$

د)  $x^2 - 5x - 12 = 0$   $x^2 - 5x - 24 = 0$   $(x-8)(x+3) = 0$   $x = 8$   $x = -3$

الف)  $x^2 - 6x - 14 = 0$   $(x-7)(x+2) = 0$   $x = 7$   $x = -2$

ب)  $x^2 + 5x + 3 = 0$   $b^2 - 4ac$   $25 - 12 = 13$   $\Delta > 0$

ج)  $x^2 + 2x + 3 = 0$   $b^2 - 4ac$   $4 - 12 = -8$   $\Delta < 0$   $x = -1$   $x = -\frac{3}{2}$

د)  $3x^2 + 3x - 2 = 0$   $b^2 - 4ac$   $9 + 24 = 33$   $\Delta > 0$   $x = \frac{-3 \pm \sqrt{33}}{6}$

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

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

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

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

$m^2 = m+2$   $m^2 - m - 2 = 0$   $(m-2)(m+1) = 0$   $m = 2$   $m = -1$

ب)  $(3, m^2)(2, 1)(m, 4)(3, m+2)(-2, m)(-1, 3)$   $m^2 = m+2$   $m^2 - m - 2 = 0$   $m = 2$   $m = -1$

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

$a^2 = 3a - 2$   $(a-1)(a-2) = 0$   $a = 1$   $a = 2$

$a = 1$  در این جواب نمی دهد چون مؤلفه اول می شود اما مؤلفه دوم مانند قبلی نیست

$$f(n) = \begin{cases} n^{n-1} & n \leq 1 \\ an + b & 1 \leq n \leq r \\ n^r & n \geq r \end{cases}$$

$$n=1 \Rightarrow a \times 1 + b = 1-1 \Rightarrow a+b=0$$

$$n \leq r \quad (r \times a) + b = r^r \quad ra + b = 1$$

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

$$f(n) \begin{cases} 2n-3 & n \geq k \\ 4-3n & n \leq k \end{cases}$$

عدد درستی هم دارند  
 $2n-3 = 4-3n$

$$5n = 7$$

$$n = \frac{7}{5} \Rightarrow k = \left\lceil \frac{7}{5} \right\rceil$$

مثال نقض  $X$   $y^2 - 4y = 0 \quad y=0 \quad y=\sqrt{4} \quad y=-\sqrt{4} \quad n=1$

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مثال نقض  $X$   $|y|=3 \quad y=\pm 3$   $(\cos \theta = \frac{1}{p})$

$y^2 \geq 0 \quad (n+1)^2 \geq 0$   $\checkmark$

$y^2 + n^2 + 2n + 1 = 0 \quad y^2 + (n+1)^2 = 0 \quad y=0 \quad (n+1)^2 = 0$

$y + n^2 = 2n - 3 \Rightarrow y + n^2 = (2n - 3)^2$

$y = (2n - 3)^2 - n^2$

$y_1^2 + 2y_1 = 5n_1, n_1 = n_2 \Rightarrow y_1^2 + 2y_1 = y_2^2 + 2y_2 \Rightarrow y_1^2 - y_2^2 + 2y_1 - 2y_2 = 0$

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

$(y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 2) = 0 \Rightarrow y_1 - y_2 = 0 \quad y_1 = y_2$   $\checkmark$

$n \sin y = g \sin n \quad y \in \mathbb{R} \Leftrightarrow n=0$   $\checkmark$

$\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \Rightarrow \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{xy}{xy}} = 4$

$n^2 + ny + y^2 = 0 \quad (n-y)^2 = 0 \quad n+y = 2 \quad n+y = 2ny$