

1) $4x^2 - 8x - 4 = 0 \rightarrow x^2 - 2x - 1 = 0 \rightarrow (x-4)(x+4) = 0 \rightarrow \begin{cases} x=4 \\ x=-4 \end{cases} \rightarrow \begin{cases} x=\frac{4}{2} \\ x=-\frac{4}{2} \end{cases}$

2) $3x^2 - 10x - 3 = 0 \rightarrow x^2 - 10x - 9 = 0 \rightarrow (x-9)(x+1) = 0 \rightarrow \begin{cases} x=9 \rightarrow x=3 \\ x=-1 \rightarrow x=-\frac{1}{3} \end{cases}$

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

4) $2x^2 - 8x - 12 = 0 \rightarrow x^2 - 4x - 6 = 0 \rightarrow (x-1)(x+3) = 0 \rightarrow \begin{cases} x=1 \rightarrow \frac{1}{2} \\ x=-3 \rightarrow -\frac{3}{2} \end{cases}$

1) $x^2 - 8x - 12 = 0 \rightarrow (x-4)(x+3) = 0 \rightarrow x = \begin{cases} 4 \\ -3 \end{cases}$

2) $2x^2 + 8x + 3 = 0 \rightarrow x^2 + 4x + 2 = 0 \rightarrow (x+1)(x+3) = 0 \rightarrow \begin{cases} x=-1 \rightarrow -\frac{1}{2} \\ x=-3 \rightarrow -\frac{3}{2} \end{cases}$

3) $x^2 + 2x + 3 = 0 \rightarrow \frac{-2 \pm \sqrt{4-12}}{2} \rightarrow \Delta < 0 \rightarrow \text{فاصله}$

4) $3x^2 + 3x - 2 = 0 \rightarrow \frac{-3 \pm \sqrt{9+24}}{6} = \frac{-3 \pm \sqrt{33}}{6} \rightarrow \begin{cases} x = \frac{\sqrt{33}-3}{6} \\ x = \frac{-\sqrt{33}-3}{6} \end{cases}$

$A \times B = \left\{ \begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix} \begin{pmatrix} 3 & 2 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix} \right\}$

$B^T = \left\{ \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix} \begin{pmatrix} 3 & 2 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix} \begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix} \right\}$

$A \times B - B^T = \left\{ \begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix} \right\}$

1) $m^2 - m - 2 = 0 \rightarrow m = 2 \rightarrow (2, 4) \rightarrow (2, 1) \rightarrow \text{تابع نیست}$
 $m = -1 \rightarrow (-1, 1) \rightarrow (-1, 1) \rightarrow \text{تابع نیست}$

2) $n = 2 \rightarrow (2, 4) \rightarrow (2, 1) \rightarrow \text{تابع نیست}$
 $n = -1 \rightarrow (-1, 1) \rightarrow (-1, 1) \rightarrow \text{تابع نیست}$
 هیچکدام تابع نیست

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

$a=1 \rightarrow (1, 1) \rightarrow (1, 1) \rightarrow \text{تابع نیست}$

$a=2 \rightarrow (2, 4) \rightarrow (2, 1) \rightarrow \text{تابع نیست}$

$f(a) = \left\{ \begin{pmatrix} 1 & 2 \\ 1 & 3 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix} \begin{pmatrix} 3 & 2 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ 3 & 2 \end{pmatrix} \right\}$

برای $a=2$ تابع نیست

$$f(1) = (1)^2 - 1 = 0$$

$$f(1) = (a+b=0) \times 2 \left. \begin{array}{l} f(1) = 2a+b=0 \\ f(2) = 2a+b=1 \end{array} \right\} \rightarrow \begin{array}{l} 2a+2b-2a-b = -1 \rightarrow b = -1 \\ a = 1 \end{array} \rightarrow a \times b = -1$$

$$f(2) = 2a+b=1$$

$$f(2) = 1$$

$$f(k) = 2k-3 = 7-3k \rightarrow \delta k = 7 \rightarrow k = 1/2$$

① X سین دوی باتوان فرد علامت - آید پس تابع نیست.

② X if $\rightarrow a=0 \rightarrow |0|+|y| = 3 \rightarrow |y| = 3 \rightarrow y = \pm 3 \rightarrow$ تابع نیست

③ X if $\pi = 90^\circ \rightarrow \cos 90^\circ = 0 \rightarrow |y| = \sqrt{1} \rightarrow |y| = 1 \rightarrow y = \pm 1$

④ ✓ $y^2 + (x+1)^2 = 0 \rightarrow \begin{cases} y=0 \\ x=-1 \end{cases}$ جمع 2 عدد نامشقی منفی پس دو عدد منفی است و تابع فک نقطه.

① $\begin{cases} x^2 - 2x + 2 = -\sqrt{y} \\ x^2 - 2x + 2 = -\sqrt{y} \end{cases} \rightarrow \sqrt{y_1} = \sqrt{y_2} \rightarrow y_1 = y_2$ تابع است

② $\begin{cases} y_1^2 + y_2^2 = \delta x \\ y_1^2 + y_2^2 = \delta x \end{cases} \rightarrow y_1^2 + y_2^2 = y_2^2 + y_1^2 \rightarrow y_1^2 - y_2^2 + 2(y_1 - y_2) = 0$
 $\rightarrow (y_1 - y_2) / (y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2) = 0 \rightarrow y_1 - y_2 = 0$
 $\rightarrow y_1 = y_2$ تابع است

① if $\rightarrow x = \pi \rightarrow y \sin \pi = \pi \sin y = 0 \rightarrow y = \pi, 2\pi, 3\pi, \dots$ تابع نیست
 مثال نقض

② $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \rightarrow \frac{x}{y} + \frac{y}{x} + 2 = 4 \rightarrow \frac{x^2 + y^2}{xy} = 2 \rightarrow x^2 + y^2 = 2xy$
 $x^2 + y^2 - 2xy = (x-y)^2 = 0 \rightarrow x = y$ تابع است