

۱۸, ۷۵

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

ب) $3x^2 - 8x - 3 = 0 \rightarrow x^2 - 8x - 9 = 0 \rightarrow (x-9)(x+1) = 0 \rightarrow \begin{cases} x = -\frac{1}{3} \\ x = 3 \end{cases}$ ✓

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

د) $2x^2 - 5x - 12 = 0 \rightarrow x^2 - 5x - 6 = 0 \rightarrow (x-6)(x+1) = 0 \rightarrow \begin{cases} x = -\frac{1}{2} \\ x = 2 \end{cases}$ ✓

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

ب) $2x^2 + 5x + 2 = 0 \rightarrow a+c = b \rightarrow \begin{cases} x = -1 \\ x = -\frac{2}{3} \end{cases}$ ✓

ج) $x^2 + 2x + 3 = 0 \rightarrow \Delta < 0 \rightarrow$ ریشه ندارد ✓

د) $2x^2 + 3x - 2 = 0 \rightarrow \Delta = b^2 - 4ac \rightarrow 9 - 4(2)(-2) = 25, x = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow \begin{cases} x = \frac{-3 + 5}{4} = \frac{1}{2} \\ x = \frac{-3 - 5}{4} = -2 \end{cases}$ ✓

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

$B = \{2, 3\}$

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

$\Rightarrow \{(1, 2), (1, 3)\}$ ✓

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

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

$a^2 = 3a - 2 \rightarrow a^2 - 3a + 2 = 0 \rightarrow \begin{cases} a = 1 \Rightarrow f(a) = \{(1, 1), (1, 2), (1, 5)\} \\ a = 2 \Rightarrow f(a) = \{(2, 4), (2, 1), (2, 8)\} \end{cases}$ ✓

بازی استاندارد

$$\begin{aligned} \text{به ازای } n=1 & \rightarrow x^2-1 = a+b \xrightarrow{x=1} a+b=0 \\ \text{به ازای } n=2 & \rightarrow a+b+2x^2 \xrightarrow{x=2} 4a+b=1 \end{aligned} \rightarrow \begin{cases} a=1, b=-1 \\ a \times b = -1 \end{cases}$$

$$\text{به ازای } n=k \rightarrow y_{n-2} = f - y_n \xrightarrow{n=k} y_{k-2} = f - y_k \rightarrow \omega k = \nu \rightarrow k = \nu / \omega$$

$$\text{الف) } y^2 - 4y + x^2 - 4x + 2 \xrightarrow{x=1} y^2 - 4y + 2 = 0 \rightarrow y = 2 \pm \sqrt{2}$$

$$\text{ب) } |x| + |y| + 2 \xrightarrow{x=1} 1 + |y| + 2 = 2 \rightarrow |y| = -1$$

$$\text{ج) } |y| = \sqrt{1 - \cos x} \rightarrow \text{به ازای نقاط } 0 = \sqrt{1 - \cos x} \rightarrow \text{دقت کم می شود و دقت کم می شود}$$

$$\text{د) } y^2 + x^2 + 2x + 1 = 0 \rightarrow y^2 + (x+1)^2 = 0 \rightarrow \sqrt{0} = 0$$

$$\sqrt{y} + x^2 + 2x - 2 \rightarrow x^2 + 2x + 2 = -\sqrt{y} \rightarrow \begin{cases} x^2 + 2x + 2 = -\sqrt{y} \\ x^2 + 2x + 2 = -\sqrt{y} \end{cases} \rightarrow \begin{cases} x_1 = x_2 = \sqrt{y} \\ x_1 = x_2 = -\sqrt{y} \end{cases}$$

$$\text{ب) } y^2 + 2y = \omega x \rightarrow y(y+2) = \omega x \rightarrow \text{راه حل ناقص}$$

$$\text{الف) } x \sin y = y \sin x \xrightarrow{x=0} 0 = y \sin 0 \rightarrow y = \infty$$

$$\text{ب) } \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \rightarrow \text{به ازای } x=y \rightarrow \text{شرط } x=y=0 \text{ را هم بگذاریم}$$

$1 - \text{ج} \quad |y| = \sqrt{1 - \cos x} \quad \xrightarrow{x = \frac{\pi}{2}} |y| = \sqrt{1 - 0} \Rightarrow |y| = 1$
 به ازای $x = \frac{\pi}{2}$ ، در 3 صفت داریم پس تبویست
 (باز هم مثال نقض زدیم نه)

9 - ب $y''' + 2y = \sin x$

$y_1''' + 2y_1 = \sin x_1$

$x_1 = x_2$

$y_1''' + 2y_1 = y_2''' + 2y_2$

$y_2''' + 2y_2 = \sin x_2$

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

I $\Rightarrow y_1 - y_2 = 0 \Rightarrow y_1 = y_2$ ✓ همه شرایط منتهی است پس سرتیغ نرسد

II $\Rightarrow y_1'' + y_1 y_2' + y_2'' + 2 = 0 \Rightarrow y_1 = \frac{-y_2 \pm \sqrt{y_2^2 - 4(y_2'' + 2)}}{2}$ ✗

$\Rightarrow y_1 = y_2$ تبویست!

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

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

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

