

۲. آزمون

$$a^2 - 5a - 4$$

$$= (a-4)(a+1)$$

$$a = \frac{4}{5} \text{ و } -\frac{1}{5}$$

$$b) a^2 - 1a - 4$$

$$= (a-4)(a+1)$$

$$a = \frac{4}{5} \text{ و } -\frac{1}{5}$$

$$c) u^2 - 4u - 12 = 0$$

$$= (u-4)(u+3)$$

$$u = \frac{4}{1} \text{ و } -\frac{3}{1}$$

$$d) u^2 - 5u - 24 = 0$$

$$(u-8)(u+3)$$

$$u = \frac{8}{1} \text{ و } -\frac{3}{1}$$

$$الف) u^2 - 5u - 12 = 0$$

$$(u-7)(u+2)$$

$$u = 7 \text{ و } -2$$

$$b) u^2 + 5u + 4 = (u+2)(u+3) \rightarrow u = -\frac{2}{1} \text{ و } -\frac{3}{1}$$

$$c) u^2 + 4u + 3 = 0$$

$$\Delta = 4 - 4(1)(3) = -8$$

$$d) 3u^2 + 4u - 2 = 0$$

$$\Delta = 4 - 4(3)(-2) = 28$$

$$u = \frac{-4 \pm \sqrt{28}}{6}$$

$$A \times B = [(1,2)(1,3)(2,2)(2,3)(3,2)(3,3)]$$

$$B^T = [(2,2)(2,3)(3,2)(3,3)]$$

$$A \times B - B^T = [(1,2)(1,3)]$$

$$الف) f(x) \rightarrow m^2 = m+2 \quad m^2 - m - 2 = 0$$

$$(m-2)(m+1) = \frac{m=2}{m=-1} \rightarrow \boxed{m=-1}$$

$$ب) g(x) \rightarrow m^2 = m+2 \rightarrow (m-2)(m+1) = 0 \rightarrow \begin{matrix} m=2 \\ m=-1 \end{matrix}$$

به ازای هیچ مقاری از m تابع نمی شود.

$$a^2 = 4a - 2 \rightarrow a^2 - 4a + 2 = 0$$

$$(a-1)(a-2)$$

$$\begin{cases} a=1 \rightarrow \alpha \\ a=2 \rightarrow \alpha \end{cases}$$

$$a \rightarrow x^2 - 1 = a + b \rightarrow a + b = 0$$

$$a = 2 \rightarrow x^2 = 2a + b \rightarrow 2a + b = 1$$

$$\begin{cases} a + b = 0 \\ 2a + b = 1 \end{cases} \rightarrow \begin{matrix} a = 1 \\ b = -1 \end{matrix}$$

$$a \times b = \boxed{-1} \quad \text{✓}$$

$$u = k \rightarrow 2k - 3 = 4 - 3k \rightarrow 5k = 7 \rightarrow \boxed{k = \frac{7}{5}} \quad \text{✓}$$

الف) $y^{\frac{3}{2}} \frac{d^2 y}{dx^2} = \dots \rightarrow y^{\frac{3}{2}} - 4y = X$ تابع نیست ✓

ب) $u = 1 \rightarrow |y| = 2 \rightarrow y = \pm 2 \rightarrow X$ تابع نیست ✓

ج) $1 - \cos u \neq 0 \rightarrow \cos 2u \leq 1 \xrightarrow{\text{مثلاً}} |y| = 1 \rightarrow y = \pm 1 \rightarrow X$ تابع نیست ✓

د) $y^{\frac{3}{2}} + \underbrace{x^{\frac{3}{2}} + 2x + 1}_{\text{هواره} + \text{ثابت}} = 0 \rightarrow$ دوتایی باید صفر باشند
 $\rightarrow$ تبدیل نقطه $\rightarrow$ تابع هست ✓

الف) $\sqrt[3]{y} = -x^{\frac{3}{2}} + 2x - 2 \xrightarrow{y_1} \sqrt[3]{y_1} = -x^{\frac{3}{2}} + 2x - 2 \xrightarrow{y_2} \sqrt[3]{y_2} = -x^{\frac{3}{2}} + 2x - 2 \rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2}$
 $y_1 = y_2$ ✓ تابع هست

ب) $\begin{cases} y_1^{\frac{3}{2}} + 2y_1 = 2x \\ y_2^{\frac{3}{2}} + 2y_2 = 2x \end{cases} \rightarrow y_1^{\frac{3}{2}} + 2y_1 = y_2^{\frac{3}{2}} + 2y_2$
 $y_1^{\frac{3}{2}} - y_2^{\frac{3}{2}} = 2y_2 - 2y_1$
 $(y_1 - y_2)(y_1^{\frac{1}{2}} + y_1^{\frac{1}{2}}y_2^{\frac{1}{2}} + y_2^{\frac{1}{2}}) = -2(y_1 - y_2)$
 $(y_1 - y_2)(y_1^{\frac{1}{2}} + y_1^{\frac{1}{2}}y_2^{\frac{1}{2}} + y_2^{\frac{1}{2}} + 2) = 0$
 $y_1 = y_2$ ✓ تابع هست

الف) $y = \frac{x \sin y}{\sin x} \rightarrow y_1 = y_2 \rightarrow \frac{x \sin y_1}{\sin x} = \frac{x \sin y_2}{\sin x}$
 $\sin y_1 = \sin y_2$ ✓ تابع نیست

! or (x و y ثابت)

$\left(\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2 \right)^2 = \frac{x}{y} + \frac{y}{x} + 2\sqrt{\frac{xy}{yx}} = 4$
 $\frac{x^{\frac{1}{2}} + y^{\frac{1}{2}}}{x^{\frac{1}{2}}y^{\frac{1}{2}}} = 2 \rightarrow x^{\frac{1}{2}} + y^{\frac{1}{2}} - 2x^{\frac{1}{2}}y^{\frac{1}{2}} = 0 \rightarrow (x - y)^{\frac{1}{2}} = 0 \rightarrow x = y$ ✓

$\frac{x^{\frac{1}{2}} + y^{\frac{1}{2}}}{x^{\frac{1}{2}}y^{\frac{1}{2}}} = 2 \rightarrow x^{\frac{1}{2}} + y^{\frac{1}{2}} - 2x^{\frac{1}{2}}y^{\frac{1}{2}} = 0 \rightarrow (x - y)^{\frac{1}{2}} = 0 \rightarrow x = y$ ✓ تابع هست

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

ہیں عبارت تنہا زمانی ہو قرار است کہ $\sqrt{\frac{x}{y}} = 1$ بالحد پس

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

