

$$a) x^2 - 2x - 34 = 0$$

$$\frac{2 \pm \sqrt{20 + 136}}{2} = \frac{2 \pm 12}{2} \rightarrow \frac{14}{2}, \frac{-10}{2} \rightarrow 7, -5$$

①

$$b) x^2 - 11x - 4 = 0$$

$$c + a = b \rightarrow (x, 1)(x, 1) \rightarrow -1, 1 \rightarrow \frac{1}{x}, x$$

$$c) x^2 - 5x - 12 = 0$$

$$\frac{5 \pm \sqrt{25 + 48}}{2} = \frac{5 \pm 11}{2} \rightarrow 8, -2 \rightarrow \frac{8}{x}, -\frac{1}{x}$$

$$d) x^2 - 2x - 24 = 0$$

$$\frac{2 \pm \sqrt{4 + 96}}{2} = \frac{2 \pm 10}{2} \rightarrow 6, -4 \rightarrow \frac{6}{x}, -\frac{4}{x}$$

$$الف) b^2 - 4ac > 0 \rightarrow 10 + 24 > 0 \checkmark \rightarrow \Delta = 34$$

$$\frac{2 \pm 10}{2} = 6, -4$$

$$ب) b^2 - 4ac > 0 \rightarrow 10 - 24 = -14 < 0 \checkmark$$

$$\frac{-2 \pm 1}{2} = \frac{1}{2}, -1$$

②

$$ج) b^2 - 4ac > 0 \rightarrow 1 - 12 < 0 \checkmark$$

$$د) b^2 - 4ac > 0 \rightarrow 1 + 24 = 25 \checkmark$$

$$\frac{-1 \pm \sqrt{25}}{2} \rightarrow \frac{-(1 \pm 5)}{2}$$

$$\rightarrow \frac{\sqrt{25} - 1}{2}$$

$$\{(1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)\} - \{(2, 2), (2, 3), (3, 2), (3, 3)\} \rightarrow \{(1, 2), (1, 3)\}$$

③

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

④

$$m + x = m^2 \rightarrow m^2 - m - x = 0 \rightarrow \frac{1 \pm \sqrt{1 + 4x}}{2} = \frac{1 \pm 3}{2} \rightarrow 2, -1 \rightarrow m = -1$$

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

$$m^2 = m + x \rightarrow m^2 - m - x = 0 \rightarrow \text{بواسطه برابری} \rightarrow m = 0 \rightarrow \text{بواسطه} \rightarrow (1, 1)$$

$$\{(1, a^2)(1, 3a+x)(a, 3a+x)\}$$

⑤

$$a^2 = 3a + x \rightarrow a^2 - 3a - x = 0 \rightarrow a + b + c = 0 \rightarrow (a-1)(a-2) \rightarrow 2, 1$$

$$a^2, 3a+x \rightarrow \frac{a \pm 2}{2} \rightarrow 1, 2 \checkmark$$

$$\rightarrow (1, 2) \rightarrow \text{بواسطه}$$

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

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

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

$$ab = 1 \times (-1) = -1$$

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$$2x-4 = 4-4x \rightarrow 6x=8 \rightarrow x = \frac{4}{3}$$

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

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$$y(y^2-4) = (x-1)(x-3) \xrightarrow{x=1} y(y^2-4)=0 \xrightarrow{y} 0, +\sqrt{4}, -\sqrt{4}$$

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$$b) \quad x=0 \quad |y|=2 \rightarrow y=+2, -2 \quad \text{تبع نیست}$$

$$c) \quad 1 - \cos x > 0 \rightarrow \cos x < 1 \quad x=180^\circ \rightarrow |y| = \sqrt{1-(-1)} = \sqrt{2} \rightarrow y = \pm\sqrt{2} \quad \text{تبع نیست}$$

$$d) \quad -y^2 = x^2 + 2x + 1 \rightarrow -y^2 = (x+1)^2 \xrightarrow{x=-1} -y^2=0 \rightarrow y=0 \quad \text{تبع نیست}$$

$$\text{جمع } x^2 + 2x + 1 = 0 \rightarrow x = -1 \text{ هر دو صفر}$$

$$الف) \quad y_1' = -x^2 + 2x - 2$$

$$y_2' = -x^2 + 2x - 2 \rightarrow y_1 = y_2 \quad \text{تبع نیست}$$

7

$$b) \quad y_1^2 + 2y_2 = 0$$

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

$$\rightarrow (y_1 - y_2)(\overbrace{y_1 + y_2 + 2y_2}^{+ \text{ صفر است}}) = 0 \quad \begin{cases} y_1 - y_2 = 0 \rightarrow y_1 = y_2 \\ \text{بیان دوم القادریل و ضمیمه} \\ \text{صفر است} \end{cases} \rightarrow \text{تبع نیست}$$

$$الف) \quad x=0 \rightarrow y \text{ بی نهایت مقدار} \Rightarrow \text{تبع نیست}$$

8

$$b) \quad \sqrt{\frac{x}{y}} = t \rightarrow t + \frac{1}{t} = 2 \rightarrow t^2 + 1 - 2t = 0 \rightarrow (t-1)^2 = 0 \rightarrow t=1$$

$$\sqrt{\frac{x}{y}} = t \rightarrow \frac{x}{y} = 1 \rightarrow x=y \quad \text{تبع نیست}$$