

الف) $4x^2 - 5x - 9 = 0 \xrightarrow{\Delta < 0} x^2 - 5x - 36 = 0 \quad (x-9)(x+4) = 0$

ب) $3x^2 - 8x - 3 = 0 \quad x^2 - 8x - 9 = 0 \quad (x-9)(x+1) = 0$

ج) $4x^2 - 4x - 3 = 0 \quad x^2 - 4x - 12 = 0$

د) $2x^2 - 5x - 12 = 0$

$x^2 - 5x - 24 = 0$

$(x-8)(x+3) = 0$

الف) $x^2 - 5x - 14 = 0$

$(x-7)(x+2) = 0$

ب) $2x^2 + 5x + 3 = 0$

$x^2 + 5x + 4 = 0$

$(x+3)(x+1) = 0$

ج) $x^2 + 2x + 3 = 0$

$\Delta < 0$

د) $3x^2 + 3x - 2 = 0$

$x = \frac{-3 \pm \sqrt{9 - (-24)}}{4} = \frac{-3 \pm \sqrt{33}}{4}$

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

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

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

$B^c = \{(1,2), (1,3), (2,2), (3,2), (3,3)\}$

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

الف) $m^2 = m + 2 \quad m^2 - m - 2 = 0 \quad (m-2)(m+1) = 0$

ب) $m^2 = m + 2 \quad (m-2)(m+1) = 0$
 هیچ متداری نمی‌توان گذاشت

$a^2 = 3a - 2$

$a^2 - 3a + 2 = 0$

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

$$x^2 - 1 = ax + b \xrightarrow{x=1} 0 = a + b \quad a = -b, b = -a \quad a \times b = -4f$$

$$x^3 = ax + b \xrightarrow{x=2} 8 = 2a + b \quad a = 2, b = 4$$

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$$2x - 3 = 4 - 3x \xrightarrow{x=\frac{K}{a}}$$

$$2K - 3 = 4 - 3K$$

$$5K = 7 \Rightarrow K = \frac{7}{5}$$

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$$y(y^2 - 4)$$

$$y^3 - 4y = x^2 - 4x + 3 \Rightarrow (x-1)(x-3) \quad x^2 - 4x + 3 = 0 \Rightarrow y^3 - 4y = y(y^2 - 4) \Rightarrow y = 0, y = \pm 2$$

$$|x| + |y| = 3 \rightarrow x=0 \Rightarrow |y|=3 \Rightarrow y=\pm 3$$

$$2) |y| = \sqrt{1 - \cos x} \rightarrow x = 40^\circ \quad 1 - \cos 40^\circ = \frac{1}{4} \Rightarrow \sqrt{\frac{1}{4}} = \frac{1}{2} \Rightarrow |y| = \frac{1}{2} \Rightarrow y = \pm \frac{1}{2}$$

$$d) y^2 + x^2 + 2x + 1 = 0 \quad y^2 + (x+1)^2 = 0 \Rightarrow y=0, x=-1$$

$$y^2 = -x^2 - 2x - 1 = -(x+1)^2 \rightarrow \text{تابع است} \quad (-1, 0) \quad \text{تابع است}$$

$$a) \sqrt[3]{y} + x^2 = 2x - 2 \quad \sqrt[3]{y} = -x^2 + 2x - 2 \quad \sqrt[3]{y_1} = -x_1^2 + 2x_1 - 2$$

$$\text{if } x_1 = x_2 \quad -x_1^2 + 2x_1 - 2 = -x_2^2 + 2x_2 - 2 \Rightarrow \sqrt[3]{y_1} = \sqrt[3]{y_2} \Rightarrow y_1 = y_2$$

$$b) y^3 + 2y = 5x \rightarrow \text{تابع است}$$

$$y_1^3 + 2y_1 = 5x_1 \quad \text{if } x_1 = x_2 \quad y_1^3 + 2y_1 = y_2^3 + 2y_2 \rightarrow y_1^3 - y_2^3 + 2y_1 - 2y_2 = 0$$

$$y_1^3 + 2y_1 = 5x_2 \quad (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2) + 2(y_1 - y_2) = 0$$

$$y_1 = -y_2 \pm \sqrt{y_2^2 - 4(y_2^2 + 2)} \quad (y_1 - y_2)(y_1^2 + y_1y_2 + y_2^2 + 2) = 0 \quad a=1, b=y_2, c=y_2^2 + 2$$

$$\Delta = y_2^2 - 4y_2^2 - 8 = -3y_2^2 - 8 \rightarrow \text{منفی دارد} \Rightarrow \text{هیچ جوابی ندارد}$$

$$x \sin y = y \sin x \rightarrow x=0 \Rightarrow y \text{ هر عددی باشد}$$

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

$$\frac{x}{y} + \frac{y}{x} = 2 \quad \frac{x^2 + y^2}{xy} = 2 \rightarrow 2xy = x^2 + y^2 \rightarrow x^2 + y^2 - 2xy = 0$$

$$(x - y)^2 = 0 \Rightarrow x = y$$