

۲. آفرین

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) $3x^2 + 3x - 2 = 0$

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

افزون
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$A = \{(1,2), (2,3)\}$

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

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

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

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

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

ب) $m^2 = m + 2 \quad (m-2)(m+1) = 0$

$a^2 = 3a - 2$

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

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

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

$$x^3 = ax + b \xrightarrow{x=2} 8 = 2a + b \quad a = 1, b = 6 \quad a \times b = 6$$

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

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

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$$y(y^2 - 4) = x^2 - 4x + 3 = (x-1)(x-3) \quad x^2 - 4x + 3 = 0 \Rightarrow y^2 - 4y = 0 \Rightarrow y = 0 \text{ یا } y = 4$$

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

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

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

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

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

$$y^3 + 2y = 5x \rightarrow$$

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

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

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

$$\Delta = y_2^2 - 4y_2^2 - 8 = -3y_2^2 - 8 \rightarrow \text{منفی است} \rightarrow \text{ریشه ندارد}$$

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

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

$$\frac{x^2 + y^2}{xy} = 2 \rightarrow x^2 + y^2 = 2xy \rightarrow x^2 - 2xy + y^2 = 0 \Rightarrow (x - y)^2 = 0 \Rightarrow x = y$$

(x و y ≠ 0) عبارت نیست

$$2-2) \quad 3x^2 + 3x - 2 = 0 \xrightarrow{\text{ریشه دلتا}} x = \frac{-3 \pm \sqrt{9 - (-24)}}{6} \rightarrow x_1 = \frac{-3 + \sqrt{33}}{6} \\ x_2 = \frac{-3 - \sqrt{33}}{6}$$

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

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

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

