

لنما حقیقت ۱۹, ۲۵ آفرین (۱, ۷۵)

$$x^2 - 5x - 6 = 0 \Rightarrow x^2 - 5x - 6 = 0 = (x-6)(x+1) = 0 \Rightarrow x = 6 \text{ یا } x = -1$$

ب) $3x^2 - 11x + 6 = 0 \rightarrow \frac{x^2 - 11x + 6}{a+c=b} = 0 \Rightarrow x = \frac{-(-11) \pm \sqrt{121 - 24}}{6} \Rightarrow x = \frac{11 \pm \sqrt{97}}{6}$

ج) $4x^2 - 12x - 1 = 0 \rightarrow x^2 - 3x - \frac{1}{4} = 0 \Rightarrow (x-4)(x+\frac{1}{4}) = 0 \Rightarrow x = 4 \text{ یا } x = -\frac{1}{4}$

د) $2x^2 - 5x - 12 = 0 \Rightarrow x^2 - 5x - 12 = 0 = (x-8)(x+3) = 0 \Rightarrow x = 8 \text{ یا } x = -3$ **دقت!**

$x^2 - 5x - 12 = (x-8)(x+3)$

الف) $x^2 - 5x - 12 = 0 \rightarrow (x-8)(x+3) = 0 \Rightarrow x = 8 \text{ یا } x = -3$ ج) $x^2 + 2x + 3 = 0 \Delta \rightarrow \frac{-2 \pm \sqrt{4 - 12}}{2} \rightarrow \frac{-2 \pm \sqrt{-8}}{2} \rightarrow \frac{-2 \pm 2i\sqrt{2}}{2} = -1 \pm i\sqrt{2}$

ب) $2x^2 + 5x + 3 = 0 \Delta \rightarrow \frac{-5 \pm \sqrt{25 - 24}}{4} = \frac{-5 \pm 1}{4} \Rightarrow x = -1 \text{ یا } x = -\frac{3}{2}$ **ریشه حقیقی ندارد**

د) $3x^2 + 13x - 2 = 0 \rightarrow x^2 + 13x - 6 = 0 \Rightarrow x = \frac{-13 \pm \sqrt{169 + 24}}{2} = \frac{-13 \pm \sqrt{193}}{2}$

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

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

$f(x) = \{(3, m), (2, 1), (-2, m), (-1, m), (3, m+2), (m, 4)\}$ $m^2 - m - 2 = 0 \Rightarrow m = -1, 2 \Rightarrow m = -1$ **عقود** (۱, ۵)

$g(x) = \{(3, m), (2, 1), (m, 4), (2, m+2), (-2, m), (-1, 3)\}$ $m^2 - m - 2 = 0 \Rightarrow m = -1, 2 \Rightarrow m = 2$ **عقود** (۲, ۴)

$f(x) = \{(1, a), (1, a-2), (a, a+2)\}$ $a^2 - 2a + 2 = 0 \Rightarrow a = 1, 2$ if $a=1 \rightarrow (a, a+2) = (1, 3) \rightarrow$ عقود **عقود** $\Rightarrow a=2$ (۲, ۴)

$f(x) = \begin{cases} x-1 & x \leq 1 \\ ax+b & 1 < x < 2 \\ x & x \geq 2 \end{cases} \rightarrow x=1 \Rightarrow \frac{1-1}{\text{مقدار}} = a+b \Rightarrow a+b=0$ $\rightarrow x=2 \Rightarrow 1 = 2a+b \Rightarrow a+b=1$ $\Rightarrow a=1, b=-1$ $\Rightarrow a+b=-64$ (۲, ۴)

$f(x) = \begin{cases} 2x-3 & x \geq k \\ 4-2x & x \leq k \end{cases} \quad x=k \Rightarrow 2k-3 = 4-2k \Rightarrow 4k=7 \Rightarrow k=\frac{7}{4}$ (۲, ۴)

الف) $f(x) = x^2 - 4x + 3 \xrightarrow{\text{تکمیل مربع}} x^2 - 4x + 4 - 1 = (x-2)^2 - 1$ $|y| = \sqrt{1 - \cos x} \xrightarrow{x=\frac{\pi}{2}} |y| = \sqrt{1 - (-1)} = \sqrt{2}$

ب) $|x| + |y| = 3 \xrightarrow{x=0} |y| = 3 \Rightarrow y = \pm 3$ $\Rightarrow y = 4$ **عقود**

ج) $9x^2 + 2x + 1 = 0 \Rightarrow y^2 + (x+1) = 0$ **عقود**

$$-1) \sqrt{y} + x^2 = 2x - 2 \Rightarrow \sqrt{y} = x_1 + 1, x_1 - 2 \quad \left\{ \sqrt{y_1} = \sqrt{y} \right\} \Rightarrow \sqrt{y_1} = \sqrt{y} \Rightarrow y_1 = y$$

$$\rightarrow y_1^2 y = ax \rightarrow y_1^2 + 2y_1 = ax \quad \left\{ \begin{aligned} y_1^2 + 2y_1 - y_1^2 - y_1^2 &= ax \\ y_1^2 + 2y_1 &= ax \end{aligned} \right. \Rightarrow y_1^2 + 2y_1 = 2(y_1 - y_1)$$

$$\Rightarrow (y_1 - y_1)(y_1 + y_1 + y_1 + y_1) = -2(y_1 - y_1) \Rightarrow (y_1 - y_1)(y_1^2 + y_1 + y_1 + 2) = 0 \Rightarrow \begin{cases} y_1 - y_1 = 0 \Rightarrow y_1 = y_1 \\ y_1^2 + y_1 + y_1 + 2 = 0 \end{cases}$$

$$\Delta \rightarrow y_1 = \frac{-y_1 \pm \sqrt{\Delta}}{2} \quad \Delta < 0 \rightarrow \text{ریشه ها را ندارد} \rightarrow y_1 = y_1$$

$$الف) x \sin y = y \sin x \quad x=0 \rightarrow 0 \times \sin y = y \times \sin 0$$

1- برای فرض صحت $\sin 0 = 0$ یعنی است

$$\rightarrow \sqrt{\frac{y}{x}} + \sqrt{\frac{x}{y}} = 2$$

$$\Rightarrow \frac{y}{x} + \frac{x}{y} + 1 = 2 \Rightarrow \frac{x^2 + y^2}{xy} = 2 \Rightarrow x^2 + y^2 - 2xy = 0$$

نکته: $x \neq y$ یا درست است!

$$\Rightarrow (x - y)^2 = 0 \xrightarrow{\text{جذر}} x - y = 0 \Rightarrow x = y \quad \text{اینجا است}$$

ب

$$د-۱) \quad 2n^2 - 2n - 12 = 0$$

$$n^2 - n - 6 = 0 \rightarrow (n-3)(n+2) = 0 \quad \nearrow n_1 = \frac{1}{2} \times 2$$

$$\rightarrow n_2 = -\frac{3}{2}$$

$$ج-۴) \quad (3, m^2) \text{ و } (3, m+2) \leadsto m^2 = m+2 \leadsto m^2 - m - 2 = 0$$

$$m=2 \rightarrow (2, 1) \text{ و } (2, 4) \quad \times$$

$$m=-1 \rightarrow (-1, 4) \text{ و } (-1, 3) \quad \times \quad \text{به ازای هیچ مقدار } m \text{ عبارت تانژانت!}$$

$$ج-۱۰) \quad \sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = 2$$

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

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

