

۲۰ عالی نوشتی!

$$3x^2 - ax + 4 = 0$$

$$\alpha = \alpha \quad \beta = 3\alpha \quad \left\{ \begin{array}{l} S = \alpha + 3\alpha = 4\alpha = \frac{a}{3} \\ P = \alpha \cdot 3\alpha = 3\alpha^2 = \frac{4}{3} \end{array} \right. \rightarrow \left\{ \begin{array}{l} \alpha^2 = \frac{4}{9} \rightarrow \alpha = \pm \frac{2}{3} \\ \alpha = \frac{a}{12} \end{array} \right.$$

$$\alpha = \frac{2}{3} \rightarrow \frac{2}{3} = \frac{a}{12} \rightarrow a = 8$$

$$\alpha = -\frac{2}{3} \rightarrow -\frac{2}{3} = \frac{a}{12} \rightarrow a = -8$$

دو مقدار $a = 8$ $a = -8$ اختلاف = $|8 - (-8)| = 16$ ✓

$$34x^2 - (m+14)x + 1 = 0 \rightarrow \left\{ \begin{array}{l} \alpha\beta = \frac{1}{34} \\ \alpha + \beta = \frac{m+14}{34} \end{array} \right. \rightarrow \frac{m+14}{34}$$

$$\sqrt{\frac{1}{\alpha}} + \frac{1}{\sqrt{\beta}} = 5 \rightarrow \frac{\sqrt{\alpha} + \sqrt{\beta}}{\sqrt{\alpha\beta}} = 5 \xrightarrow{\text{تکثیر}} \frac{S + 2\sqrt{P}}{P} = \frac{\frac{m+14}{34} + 2(\frac{1}{34})}{\frac{1}{34}} = \frac{m+14+2}{1} = m+16 = 5 \Rightarrow m = -11$$

$$mx^2 + 3m + 2 \xrightarrow{m=-1} -x^2 + 3m + 2$$

$$\alpha\beta = ? \rightarrow P = \frac{c}{a} = -2$$

$$kx^2 + kx^2 - 9x - 2 = 0$$

$$\alpha + \beta = -1 \rightarrow x^2 - 5m + p$$

$$\alpha\beta = -2$$

$$k = ?$$

اینجا می توانیم معادله دوم را بنویسیم که با ضرب شدن در یک معادله دیگر اول این معادله دوم به دست می آید

$$\rightarrow x^2 - x - 2 = 0 \quad \left\{ \begin{array}{l} \alpha = -1 \\ \beta = 2 \end{array} \right. \quad \alpha = -1 \rightarrow f(-1) + k(-1)^2 - 9(-1) - 2 = 0$$

$$-4 + k + 9 - 2 = 0 \rightarrow k = -3$$

$$x^2 + 4x + a = 0 \rightarrow \left\{ \begin{array}{l} S = -4 \\ P = a \end{array} \right.$$

$$a < \beta < 0$$

$$3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 15$$

$$a = ?$$

$$\alpha - \beta < 0$$

$$\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{16 - 4a}}{1}$$

$$\frac{S^2 - 4P}{(\alpha - \beta)(\alpha + \beta)} = \frac{16 - 4a}{(-4)(-4)} = 12\sqrt{2} + 15$$

$$\Rightarrow \frac{16 - 4a}{16} = 12\sqrt{2} + 15 \Rightarrow 16 - 4a = 192\sqrt{2} + 240 \Rightarrow -4a = 192\sqrt{2} + 224 \Rightarrow a = -48\sqrt{2} - 56$$

$$x^2 - vx^2 - 5 = 0 \xrightarrow{\text{تغییر متغیر}} x^2 = t \rightarrow t^2 - vt - 5 = 0 \rightarrow t = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{v \pm \sqrt{v^2 + 20}}{2}$$

$$2p^2 - 3sp + 2s = ?$$

$$x = \pm \sqrt{\frac{v + \sqrt{v^2 + 20}}{2}} \leftarrow x = \pm \sqrt{t} \leftarrow \text{①} \quad \frac{v + \sqrt{v^2 + 20}}{2}$$

$$\left\{ \begin{array}{l} S = 0 \\ P = -\frac{v + \sqrt{v^2 + 20}}{2} \end{array} \right. \Rightarrow 2p^2 - 3sp + 2s = 2\left(-\frac{v + \sqrt{v^2 + 20}}{2}\right)^2 + 0 + 0 = \frac{1}{2} \times (118 + 14\sqrt{49}) = 59 + 7\sqrt{49}$$

$\gamma m^2 - am + b = 0 \rightarrow \alpha', \beta' \rightarrow \begin{cases} \alpha' + \beta' = a/\gamma \\ \alpha'\beta' = +b/\gamma \end{cases}$
 $\gamma am^2 + am - 4 \rightarrow \alpha, \beta \rightarrow \begin{cases} \alpha + \beta = -1/\gamma \\ \alpha\beta = -3 \end{cases}$
 $\alpha' = \alpha + \frac{1}{\gamma}$
 $\beta' = \beta + \frac{1}{\gamma}$
 $\alpha' + \beta' = \alpha + \beta + \frac{2}{\gamma} \rightarrow \frac{1}{\gamma} = a/\gamma \rightarrow \boxed{a=1}$
 $\Rightarrow \alpha = \frac{-1 \pm \sqrt{1+12}}{2} = \frac{-1 \pm \sqrt{13}}{2}$
 $\alpha'\beta' = -1.5 \times 2 = -3 \rightarrow +\frac{b}{\gamma} = -3 \rightarrow \boxed{b=-4} \Rightarrow \left[\frac{ab}{\gamma}\right] = \left[\frac{-4}{1}\right] = -4$

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$am^2 - am - b = 0$
 $f_0 \beta^2 + f_0 \alpha^2 - f_0 \beta = 14 \xrightarrow{\text{مقایسه}} f_0 \beta^2 - f_0 \beta + f_0 (\beta^2 + \alpha^2) = 14$
 $\Rightarrow a(m^2 - m) - b = 0 \rightarrow m^2 - m = \frac{b}{a} \xrightarrow{\alpha=\beta} \beta^2 - \beta = \frac{b}{a}$
 $\Rightarrow f_0 \left(\frac{b}{a}\right) + f_0 \left(1 + \frac{b}{a}\right) = 14 \rightarrow 4_0 \left(\frac{b}{a}\right) = -3 \Rightarrow \frac{b}{a} = -\frac{3}{4_0} = -\frac{1}{2_0} \Rightarrow \boxed{a = -2_0 b}$
 $f_0 \left(\frac{b}{a}\right) + f_0 \left(\frac{b}{a}\right) = 14 - 2_0$
 $\text{فاصله} = |\alpha - \beta| = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{f_0 - 1_0}}{|-2_0|} = \frac{\sqrt{3_0}}{2_0} = \frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{15}}{5}$

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$m^2 - (a+1)m + a = 0 \xrightarrow{\text{فرد متوالی}} \alpha, \beta \rightarrow \begin{cases} S = a+1 \\ P = a \end{cases}$
 $\alpha^2 - (2a+1)\alpha + b = 0 \xrightarrow{\text{زوج متوالی}} \alpha', \beta' \rightarrow \begin{cases} S = a+1 \\ P = a \end{cases}$
 $\alpha\beta \rightarrow ? \rightarrow P = a = \alpha\beta \rightarrow \begin{cases} \alpha' = \alpha - 1 \\ \beta' = \beta + 3 \end{cases} \rightarrow (\alpha-1)(\beta+3) = a \rightarrow \begin{cases} a = 3 \checkmark \\ a = -1 \times \end{cases}$
 $m^2 - (2a+1)m + b = 0 \rightarrow m^2 - 1_0m + b = 0 \rightarrow P = b \rightarrow \begin{cases} a = 3 \checkmark \\ a = -1 \times \end{cases}$
 $P = a = 3 \Rightarrow 2f - 3 = 21 \checkmark \rightarrow \alpha, \beta = 4, 4 \rightarrow P = 2f$

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$m^2 + m - 1 - m^2 = 0 \rightarrow \alpha, \beta \rightarrow \begin{cases} S = -1 \\ P = -(1+m^2) \end{cases}$
 $\min |\alpha' + \beta'| = ? \rightarrow \alpha' + \beta' = S^2 - 2P$
 $(-1)^2 - 2(-(1+m^2)) = 1 + 2 + 2m^2 = 3 + 2m^2$

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$\Delta > 0 \rightarrow b^2 - 4ac = 1 + 4 + 4m^2 > 0 \rightarrow 4m^2 + 5 > 0 \rightarrow m^2 > -\frac{5}{4} \checkmark$
 $3 + 2m^2 \rightarrow m = 0 \rightarrow 3 + 2(0) = 3 \checkmark$

$A(2, y) \rightarrow \text{عرضی}$
 $B(-5, y) \rightarrow \text{عرضی}$
 $\text{عرضی} = 1 \rightarrow \text{ext} \big|_{y=1}$
 $\alpha' + \beta' = 5$
 $\text{عرضی} = ? \rightarrow a(x-h)^2 + k = a(x+1)^2 + 1 \rightarrow am^2 + 2am + a + 1 = 0 \rightarrow \begin{cases} S = -2 \\ P = \frac{a+1}{a} \end{cases}$
 $\Rightarrow \alpha' + \beta' = S^2 - 2P = (-2)^2 - 2\left(\frac{a+1}{a}\right) = 4 - 2\left(\frac{a+1}{a}\right) = 2 \Rightarrow 2\left(\frac{a+1}{a}\right) = 2$
 $\frac{2a+2}{a} = -1 \rightarrow 2a+2 = -a \rightarrow 3a = -2 \rightarrow \boxed{a = -\frac{2}{3}}$
 $a+1 = -\frac{2}{3} + 1 = \frac{1}{3} \checkmark \rightarrow \text{عرضی}$

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