

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

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

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

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

تفاوت = ؟ $\rightarrow \left\{ \begin{array}{l} a = 8 \\ a = -8 \end{array} \right. \rightarrow \text{اختلاف} = |8 - (-8)| = 16$

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

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

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

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

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

$$\alpha + \beta = -1$$

$$\alpha\beta = -2$$

$$k = ?$$

این معادله را می توانیم معادله درجه دوم را بنویسیم که با ضرب شدن

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

$$-f + k + 9 - 2 = 0 \rightarrow k \Rightarrow k + 3 = 0 \rightarrow k = -3$$

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

$$a < b < 0$$

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

$$a = ?$$

$$d - b < 0$$

$$\rightarrow 2.5\alpha^2 + 0.5\alpha^2 + 2.5\beta^2 - 0.5\beta^2 = 2.5(\alpha^2 + \beta^2) + 0.5(\alpha^2 - \beta^2) = 12\sqrt{2} + 15$$

$$\Rightarrow 2.5(34 - 2a) + 0.5(-\sqrt{34 - 4a})(-4) = 12\sqrt{2} + 15$$

$$95 - 5a + 2\sqrt{34 - 4a} = 12\sqrt{2} + 15 \Rightarrow 5 - 5a + 2\sqrt{34 - 4a} = 12\sqrt{2} \Rightarrow a = 1$$

$$x^2 - vx^2 - 5 = 0 \xrightarrow{\text{تغییر متغیر}} x = t \rightarrow t^2 - vt - 5 = 0 \rightarrow t = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{v \pm \sqrt{49}}{2}$$

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

$$x = \pm \sqrt{\frac{v + \sqrt{49}}{2}} \leftarrow x = \pm \sqrt{t} \leftarrow \text{①} \quad \frac{v + \sqrt{49}}{2}$$

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

$\gamma m^2 - am + b = 0 \rightarrow \alpha', \beta' \rightarrow \begin{cases} \alpha' + \beta' = a/\gamma \\ \alpha'\beta' = +\frac{b}{\gamma} \end{cases}$
 $\gamma am^2 + am - 4 \rightarrow \alpha, \beta \rightarrow \begin{cases} \alpha + \beta = -\frac{1}{\gamma} \\ \alpha\beta = -3 \end{cases}$
 $\alpha' = \alpha + \frac{1}{\gamma}$
 $\beta' = \beta + \frac{1}{\gamma}$
 $\alpha' + \beta' = \alpha + \beta + \frac{2}{\gamma} \rightarrow \frac{1}{\gamma} = a/\gamma \rightarrow \boxed{a=1}$
 $\Rightarrow \alpha = \frac{-1 \pm \sqrt{1+4\gamma}}{2\gamma} = \frac{-1 \pm \sqrt{1+4\gamma}}{2\gamma}$
 $\beta, \alpha \rightarrow \begin{cases} \alpha' \rightarrow -1, 5, 2 \\ \beta' \rightarrow \end{cases}$
 $\left[\frac{ab}{\gamma}\right] = 8 \Rightarrow \alpha'\beta' = -1.5 \times 2 = -3 \rightarrow +\frac{b}{\gamma} = -3 \rightarrow \boxed{b=-4} \Rightarrow \left[\frac{ab}{\gamma}\right] = \left[\frac{-4}{1}\right] = -4$

$am^2 - am - b = 0$
 $f_0 \beta^2 + \gamma_0 \alpha^2 - \gamma_0 \beta = 14 \xrightarrow{\text{مقایسه کردن}} \gamma_0 \beta^2 - \gamma_0 \beta + \gamma_0 (\beta^2 + \alpha^2) = 14$
 $\Rightarrow \alpha' = -\gamma_0 b$
 $\Rightarrow \gamma_0 \left(\frac{b}{a}\right) + \gamma_0 \left(1 + \frac{\gamma_0 b}{a}\right) = 14 \rightarrow 4_0 \left(\frac{b}{a}\right) = -3 \Rightarrow \frac{b}{a} = -\frac{3}{4_0} = -\frac{1}{\gamma_0} \Rightarrow \boxed{a = -\gamma_0 b}$
 $\gamma_0 \left(\frac{b}{a}\right) + f_0 \left(\frac{b}{a}\right) = 14 - \gamma_0$
 $\Delta = |a - \beta| = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{f_0 - 1_0}}{|-\gamma_0|} = \frac{\sqrt{3\gamma_0}}{\gamma_0} = \frac{\sqrt{3}}{\sqrt{\gamma_0}} = \frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{3}}{\sqrt{5}}$

$m^2 - (a+1)m + a = 0 \xrightarrow{\text{ریشه}} \alpha, \beta \rightarrow \text{فرد متوالی} \rightarrow S = a+1$
 $\alpha' = \alpha + 1, \beta' = \beta$
 $\alpha^2 - (\gamma a + 1)\alpha + b = 0 \xrightarrow{\text{ریشه}} \alpha', \beta' \rightarrow \text{زوج متوالی}$
 $\alpha' = \alpha + 1, \beta' = \beta$
 $\alpha' = \alpha + 1, \beta' = \beta \rightarrow \alpha' - \beta' = 1$
 $\alpha' = \alpha + 1, \beta' = \beta \rightarrow \alpha' - \beta' = 1$
 $\alpha' = \alpha + 1, \beta' = \beta \rightarrow \alpha' - \beta' = 1$

$m^2 + m - 1 - m^2 = 0 \xrightarrow{\text{ریشه}} \alpha, \beta \rightarrow \begin{cases} S = -1 \\ P = -(1+m^2) \end{cases}$
 $\min |\alpha' + \beta'| = 8 \rightarrow \alpha' + \beta' = \frac{S^2 - 4P}{4} \rightarrow (-1)^2 - 4(-(1+m^2)) = 1 + 4 + 4m^2 = 5 + 4m^2$

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

$A(2, y) \rightarrow \text{عرضی}$
 $B(-5, y) \rightarrow \text{عرضی}$
 $\alpha' + \beta' = 5$
 $\alpha' = \alpha + 1, \beta' = \beta$
 $\alpha' + \beta' = 5 \rightarrow \alpha + \beta + 1 = 5 \rightarrow \alpha + \beta = 4$

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