

$$3x^2 - ax + 8 = 0 \quad \text{ریشه ها: } \alpha, 3\alpha \rightarrow \frac{1}{\alpha} + \frac{1}{3\alpha} = \frac{a}{3} \rightarrow \frac{4}{3\alpha} = \frac{a}{3} \rightarrow a = \frac{4}{\alpha}$$

$$\Rightarrow \text{ضرب ریشه ها} \Rightarrow \frac{8}{3} = 3\alpha^2 \Rightarrow \alpha^2 = \frac{8}{9} \Rightarrow \alpha = \pm \frac{\sqrt{24}}{3}$$

$$\Rightarrow \text{مجموع ریشه ها} \Rightarrow \frac{a}{3} = \frac{4}{3} + 3 \Rightarrow \frac{a}{3} = \frac{16}{3} \Rightarrow a = 16 \quad \text{یا} \quad \frac{a}{3} = -\frac{4}{3} - 3 = -\frac{13}{3} \Rightarrow a = -13$$

$$\text{خواسته سوال: } 16 - (-13) = 29$$

$$3x^2 - (m+4)x + 1 = 0 \quad \text{ریشه ها: } \alpha, \beta \rightarrow \frac{1}{\alpha} + \frac{1}{\beta} = 2 \Rightarrow \frac{\alpha + \beta}{\alpha\beta} = 2 \Rightarrow \frac{m+4}{1} = 2 \Rightarrow m = -2$$

$$\left. \begin{array}{l} \text{ضرب ریشه ها} = \frac{1}{3} \\ \text{مجموع ریشه ها} = \frac{m+4}{3} \end{array} \right\} \Rightarrow \frac{\frac{m+4}{3} + 2\sqrt{\frac{1}{3}}}{\frac{1}{3}} = 2 \Rightarrow \frac{m+4+2\sqrt{3}}{1} = 2 \Rightarrow m+4+2\sqrt{3} = 2 \Rightarrow m = -2-2\sqrt{3}$$

$$mx^2 + 2x + 2 = 0 \Rightarrow -x^2 + 3x + 2 = 0 \rightarrow \text{خواسته سوال} = \text{ضرب ریشه ها} = \frac{2}{-1} = -2$$

$$x^2 + kx^2 - 9x - 2 = 0 \quad \alpha + \beta = 1 \quad \alpha \cdot \beta = -2$$

$$\alpha + \beta = 1 \Rightarrow \alpha^2 + \beta^2 + 2\alpha\beta = 1 \Rightarrow \alpha^2 + \beta^2 + 2(-2) = 1 \Rightarrow \alpha^2 + \beta^2 = 5$$

$$\Rightarrow \alpha^2 + \beta^2 - 2\alpha\beta = 1 - 2(-2) = 5 \Rightarrow (\alpha - \beta)^2 = 5 \Rightarrow \alpha - \beta = \pm\sqrt{5}$$

$$\left. \begin{array}{l} \alpha + \beta = 1 \\ \alpha - \beta = \sqrt{5} \end{array} \right\} \Rightarrow \alpha = \frac{1+\sqrt{5}}{2}, \beta = \frac{1-\sqrt{5}}{2}$$

$$x^2 + kx^2 - 9x - 2 = 0 \xrightarrow{x=1} 1 + k - 9 - 2 = 0 \Rightarrow k = 10$$

$$\xrightarrow{x=2} 4 + 4k - 18 - 2 = 0 \Rightarrow k = 10$$

$$x^2 + 4x + a = 0 \quad \alpha < \beta < 0 \rightarrow \alpha^2 = -4\alpha - a$$

$$2\alpha^2 + 2\beta^2 = 12\sqrt{2} + 18 \Rightarrow (-4\alpha - a) + (-4\beta - a) = 12\sqrt{2} + 18 \Rightarrow -4(\alpha + \beta) - 2a = 12\sqrt{2} + 18$$

$$\Rightarrow \alpha = \frac{12\sqrt{2} + 18 + 2a}{-4}$$

$$\beta = \frac{12\sqrt{2} + 18 - 2a}{-4} \quad \leftarrow \text{برای } \beta \text{ این مورد } \sqrt{2} + 1 \text{ باید باشد}$$

$$\Rightarrow \text{مجموع ریشه ها} \Rightarrow \alpha + \beta = -4 \Rightarrow \frac{12\sqrt{2} + 18 + 2a}{-4} + \frac{12\sqrt{2} + 18 - 2a}{-4} = -4 \Rightarrow \frac{24\sqrt{2} + 36}{-4} = -4 \Rightarrow 24\sqrt{2} + 36 = 16 \Rightarrow a = -10$$

$$x^2 - 7x^2 - 9 = 0 \Rightarrow -6x^2 - 9 = 0 \Rightarrow \Delta = b^2 - 4ac = 81 - 216 = -135 < 0 \Rightarrow \Delta < 0$$

$$\Rightarrow S = \frac{-b}{a} = 7 > 0 \quad \text{محاصل ضرب} = \frac{c}{a} = -\frac{9}{6} < 0 \rightarrow \text{برای } \Delta < 0 \text{ ریشه ها } \Rightarrow x = \pm \sqrt{t_1}$$

$$\Rightarrow x_1 = \sqrt{t_1}, x_2 = -\sqrt{t_1} \quad \text{مجموع ریشه ها} \Rightarrow S = x_1 + x_2 = 0$$

$$t_1 = \text{مطلوبه}$$

$$\Rightarrow t_1 = \frac{b^2 - 4ac}{4a^2} = \frac{49 - 216}{36} = -\frac{167}{36}$$

$$P = x_1 \cdot x_2 = (\sqrt{t_1})(-\sqrt{t_1}) = -t_1 = \frac{167}{36}$$

$$2x^2 - ax + b = 0 \rightarrow \begin{matrix} \text{ریشه} \\ \text{ها} \end{matrix} = \alpha + \frac{1}{\alpha}, \beta + \frac{1}{\beta} \Rightarrow S = \alpha + \beta + 1 = \frac{a}{\gamma} \quad P = \alpha\beta + \frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\alpha\beta} = \frac{b}{\gamma}$$

$$4ax^2 + ax - 6 = 0 \rightarrow \begin{matrix} \text{ریشه} \\ \text{ها} \end{matrix} = \alpha, \beta \Rightarrow S = \alpha + \beta = \frac{-a}{4a} = -\frac{1}{4} \quad P = \alpha\beta = \frac{-6}{4a} \Rightarrow \alpha\beta = -\frac{3}{2}$$

$$\frac{S}{\alpha + \beta + 1} = \frac{a}{\gamma} \Rightarrow \frac{-\frac{1}{4} + 1}{\frac{1}{4} + 1} = \frac{a}{\gamma} \Rightarrow \frac{\frac{3}{4}}{\frac{5}{4}} = \frac{a}{\gamma} \Rightarrow \frac{3}{5} = \frac{a}{\gamma} \Rightarrow a = \frac{3\gamma}{5}$$

خواسته سوال: $\begin{bmatrix} a & b \\ \gamma \end{bmatrix} = \begin{bmatrix} \frac{3\gamma}{5} & -\frac{6}{4} \end{bmatrix} = \begin{bmatrix} 3 & -6 \end{bmatrix} = \begin{bmatrix} 3 \\ -6 \end{bmatrix}$

$$\alpha\beta + \frac{1}{\alpha} + \frac{1}{\beta} + \frac{1}{\alpha\beta} = \frac{b}{\gamma} \Rightarrow -\frac{3}{2} - \frac{1}{\frac{1}{4}} + \frac{1}{\frac{1}{4}} = \frac{b}{\gamma} \Rightarrow b = -\frac{6}{\gamma}$$

$$ax^2 - ax - b = 0 \quad S = \alpha + \beta = \frac{a}{a} = 1 \quad P = \alpha\beta = \frac{-b}{a} \quad a\beta^2 - a\beta - b = 0 \Rightarrow \beta^2 - \beta = \frac{b}{a}$$

برای برابری بودن تعداد β و β^2 ها این $\frac{b}{a}$ مناسب نیست

$$40\beta^2 + 20\alpha^2 - 20\beta = 17$$

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

$$\Rightarrow 40(1-\alpha)^2 + 20\alpha^2 - 20(1-\alpha) = 17 \Rightarrow 40 - 80\alpha + 40\alpha^2 + 20\alpha^2 - 20 + 20\alpha = 17$$

$$\Rightarrow 60\alpha^2 - 60\alpha + 20 = 0 \Rightarrow 3\alpha^2 - 3\alpha + 1 = 0 \xrightarrow[\text{همان مدار}]{\text{به صورت}} ax^2 - ax - b = 0$$

$$|\alpha - \beta| = \frac{\sqrt{\Delta}}{|a|} \Rightarrow 20\alpha^2 - 20\alpha + 1 = 0 \Rightarrow \Delta: (-20)^2 - 4(20)(1) = 320$$

$$\Rightarrow |\alpha - \beta| = \frac{\sqrt{320}}{20} = \frac{16\sqrt{5}}{20} = \frac{4\sqrt{5}}{5}$$

$$x^2 - (a+1)x + a = 0 \Rightarrow \begin{matrix} \text{ریشه} \\ \text{ها} \end{matrix} = \alpha, \alpha + 2 \quad \begin{matrix} \alpha^2 + 2\alpha = a \\ \alpha^2 + 2\alpha + 2 = a + 2 \end{matrix}$$

$$\begin{matrix} \text{ریشه} \\ \text{ها} \end{matrix} = 1, 3$$

$$a = 3 \leftarrow 2\alpha + 1 = a$$

$$(\alpha^2 + 2\alpha + 2) = 2\alpha + 3 \Rightarrow (\alpha + 2)^2 = 2\alpha + 3$$

$$x^2 - (2a+1)x + b = 0 \Rightarrow \begin{matrix} \text{ریشه} \\ \text{ها} \end{matrix} = \beta, \beta + 2$$

$$2\beta + 2 = 2a + 1 \Rightarrow 2\beta + 2 = 2(3) + 1 \Rightarrow 2\beta + 2 = 7 \Rightarrow 2\beta = 5 \Rightarrow \beta = \frac{5}{2}$$

$$\Rightarrow 2\beta = 5 \Rightarrow \beta = \frac{5}{2}$$

$$2\alpha + 1 = \alpha^2 + 2\alpha \Rightarrow \alpha^2 = 1 \Rightarrow \alpha = 1$$

$$\begin{matrix} \text{ضرب ریشه} \\ \text{های مدار} \\ \text{اول} \end{matrix} \Rightarrow 1 \times 3 = 3$$

$$\begin{matrix} \text{ضرب ریشه های} \\ \text{مدار دوم} \end{matrix} \Rightarrow 4 \times \frac{5}{2} = 10$$

$$\begin{matrix} \text{اختلاف} \\ \text{ضرب} \end{matrix} \Rightarrow 10 - 3 = 7$$

$$x^2 + x - 1 - m^2 = 0 \rightarrow \begin{matrix} \text{ریشه} \\ \text{ها} \end{matrix} = \alpha, \beta$$

$$\alpha^2 + \beta^2 = S^2 - 2P = (1+m^2)^2 - 2 \Rightarrow (1)^2 - 2 = -1$$

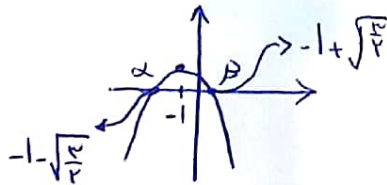
$$\begin{matrix} S = 1 + m^2 \\ P = 1 \end{matrix}$$

$$\Delta = 1 + 4 + 4m^2 > 0 \Rightarrow \Delta \text{ همواره } \oplus$$

مداخل با به
صفر باشد

$$\begin{matrix} \text{عرض} \\ \text{سوی} \end{matrix} = 1 \quad \begin{matrix} \text{طول} \\ \text{سوی} \end{matrix} \Rightarrow (-5, y), (3, y) \Rightarrow \text{مختصات} = \frac{3-(-5)}{2} = -1$$

$$\begin{matrix} \text{رأس} \\ \text{سوی} \end{matrix} \Rightarrow (-1, 1)$$



$$\alpha \Rightarrow -1 - x \quad \beta \Rightarrow -1 + x \quad \alpha^2 + \beta^2 = 0$$

$$\Rightarrow x^2 + 2x + 1 + x^2 - 2x + 1 = 0 \Rightarrow 2x^2 + 2 = 0 \Rightarrow x^2 = -1 \Rightarrow x = \pm i$$

$$\Rightarrow 2x^2 = -2 \Rightarrow x^2 = -1 \Rightarrow x = \pm i$$

$$y = a(x + 1 + \sqrt{\frac{3}{4}})(x + 1 - \sqrt{\frac{3}{4}}) \xrightarrow{(-1, 1)} 1 = a(-1 + 1 + \sqrt{\frac{3}{4}})(-1 + 1 - \sqrt{\frac{3}{4}})$$

$$\Rightarrow 1 = a(\sqrt{\frac{3}{4}})(-\sqrt{\frac{3}{4}}) \Rightarrow 1 = -\frac{3}{4}a \Rightarrow \frac{3}{4}a = -1 \Rightarrow a = -\frac{4}{3}$$

$$y = -\frac{4}{3}(x + 1 + \sqrt{\frac{3}{4}})(x + 1 - \sqrt{\frac{3}{4}}) \Rightarrow y = -\frac{4}{3}x^2 - \frac{8}{3}x + \frac{4}{3}$$

در عرض $\frac{1}{3}$
مورد y کا
در شکل
(0, 1/3) نقطه می آید