

$$2 = -\frac{1}{2(a-1)} \Rightarrow 2(a-1) = -1 \Rightarrow a = \frac{3}{4}$$

$$y = -\frac{1}{4}x^2 + x + 3 \rightarrow x^2 - 4x - 12 = 0$$

$$x = \frac{4 \pm \sqrt{16 + 48}}{2} = \frac{4 \pm 8}{2} \Rightarrow x_1 = 6, x_2 = -2$$

$$= \text{طول مسیله} = x_1 = 6 \quad \checkmark$$

$$\begin{array}{c} x_1 \quad x_2 \\ | \quad | \\ - \quad + \quad - \end{array} \Rightarrow a < 0 \Rightarrow m < 0 \quad \textcircled{1}$$

$$\Delta > 0 \Rightarrow 4a - 4m^2 > 0 \Rightarrow -\frac{a}{4} < m < \frac{a}{4} \quad \textcircled{2}$$

$$\textcircled{1} \cap \textcircled{2} \rightarrow -\frac{a}{4} < m < 0 \quad \checkmark$$

$$x^2 - 5x + p = y = 0 \Rightarrow 5 = \frac{3 + \sqrt{a}}{3} + \frac{3 - \sqrt{a}}{3} = 2 \quad \textcircled{1}$$

$$p = \frac{3 + \sqrt{a}}{3} \times \frac{3 - \sqrt{a}}{3} = \frac{9 - a}{9} = \frac{4}{9} \quad \textcircled{2}$$

$$\textcircled{1}, \textcircled{2} \rightarrow 0 = x^2 - 3x + \frac{4}{9} \xrightarrow{\times 9} 9x^2 - 11x + 4 = 0 \quad \checkmark$$

$$\begin{cases} \alpha + \beta = \frac{4}{3} = 4 \Rightarrow \beta = 4 - \alpha \Rightarrow 3\alpha^2 + (4 - \alpha)^2 = 12 \rightarrow 4\alpha^2 - 8\alpha + 4 = 0 \quad \textcircled{1} \\ \alpha\beta = \frac{m+2}{3} \quad \textcircled{2} \end{cases}$$

$$\textcircled{1} \rightarrow \alpha^2 - 2\alpha + 1 = 0 \Rightarrow (\alpha - 1)^2 = 0 \Rightarrow \alpha = 1 \Rightarrow \beta = 4 - 1 = 3 \quad \textcircled{3}$$

$$\textcircled{2}, \textcircled{3} \rightarrow \frac{m+2}{3} = 3 \times 1 \Rightarrow m = 7 \quad \checkmark$$

$$\text{عزت}(2, 9) \rightarrow y = a(x-2)^2 + 9 \xrightarrow{x=0} 5 = a(0-2)^2 + 9 \Rightarrow 4a = -4 \Rightarrow a = -1$$

$$\Rightarrow y = -(x-2)^2 + 9 \xrightarrow{y=0} -(x-2)^2 = -9 \Rightarrow x-2 = \pm 3 \Rightarrow x = -1 \text{ و } 5$$

$$\begin{array}{c} -1 \quad 5 \\ | \quad | \\ - \quad + \quad - \end{array} \Rightarrow \text{سوی در بازه } -1 < x < 5 \quad \checkmark$$

$$\begin{cases} \alpha + \beta = \frac{V}{\alpha} \\ \alpha\beta = \frac{q\beta}{\alpha} \Rightarrow \alpha^2 = q \Rightarrow \alpha = \pm \sqrt{q} \quad (1) \end{cases}$$

حالت اول: $\alpha = -\sqrt{q} \Rightarrow \beta = \frac{V}{-\sqrt{q}} + \sqrt{q} = \frac{V}{\sqrt{q}} \checkmark (2)$

حالت دوم: $\alpha = \sqrt{q} \Rightarrow \beta = \frac{V}{\sqrt{q}} - \sqrt{q} = \frac{V}{\sqrt{q}} - \sqrt{q} \times$

①② $\rightarrow \frac{1}{\alpha} + \frac{1}{\beta} = \frac{1}{-\sqrt{q}} + \frac{1}{\frac{V}{\sqrt{q}}} = \frac{V}{q} \rightarrow \boxed{\frac{V}{q}} \checkmark$

$$\alpha + \beta = -m, \alpha\beta = -pm$$

$$\alpha = -\sqrt{m} \Rightarrow \alpha^2 = -m\alpha + pm \xrightarrow{\text{با } \alpha \text{ ضرب}} (-m\alpha + pm) - m\beta = 1 \Rightarrow -m(\alpha + \beta) + pm = 1$$

$$\Rightarrow m^2 + pm - 1 = 0 \Rightarrow (m+4)(m-1) = 0 \rightarrow m = 1 \text{ یا } m = -4 \quad \Delta < 0$$

$$\alpha + \beta = -m \xrightarrow{m=1} \alpha + \beta = -1 \checkmark$$

$$\alpha + \beta = 4 \times$$

$$f\left(-\frac{1}{m}\right) = 1 \Rightarrow m\left(\frac{1}{m^2}\right) + 4\left(-\frac{1}{m}\right) + \frac{m}{1} + V = \frac{1}{m} - \frac{4}{m} + \frac{m}{1} + V = \frac{-3}{m} + \frac{m}{1} + V$$

$$\frac{-3}{m} + \frac{m}{1} + V = 1 \Rightarrow m^2 - 3m - 1 = 0 \Rightarrow (m-4)(m+1) = 0 \Rightarrow m = 4 \text{ یا } m = -1$$

و) $a < 0 \Rightarrow m = -1 \rightarrow -1x^2 + 4x + 4 = 0 \rightarrow \frac{-4 \pm \sqrt{16+4}}{-1} \rightarrow \frac{-4+2}{-1} = -2$
 $\Rightarrow \boxed{K=3} \checkmark$

مثلاً $(2, 4) \Rightarrow y = a(x-2)^2 + 4 \xrightarrow{x=0} 4 = a(0-2)^2 + 4 \Rightarrow 4a + 4 = 4 \Rightarrow a = 0$

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

$$\frac{1}{x_1} + \frac{1}{x_2} = \frac{x_1 + x_2}{x_1 x_2} \Rightarrow \frac{2 + 2\sqrt{3} + 2 - 2\sqrt{3}}{(2+\sqrt{3})(2-\sqrt{3})} = \frac{4}{4-3} = 4$$

احتیاج به محاسبه ریشه ها نداریم بنویسند $S = -\frac{b}{a}$
 و $P = \frac{c}{a}$ رو بدست بیاری!

$$x_1 + x_2 = 4a + 4 \rightarrow x_2 = 4a + 4 \quad x_1 x_2 = C = 3a^2 + 4a + 3$$

$$\Rightarrow 2(4a+4) = 3a^2 + 4a + 3 \Rightarrow 3a^2 - 4a - 1 = 0$$

$$a = \frac{4 \pm \sqrt{16+12}}{6} = \frac{4 \pm 5}{3} \rightarrow a = 1 \text{ یا } a = -\frac{1}{3}$$

$$a = 1 \rightarrow x_2 = 4(1) + 4 = 8 \checkmark$$

$$a = -\frac{1}{3} \rightarrow x_2 = 4\left(-\frac{1}{3}\right) + 4 = \frac{8}{3} \checkmark$$