

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

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

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

$$= \text{طول مسیله} = x_1 = 6$$

۱

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

$$\Delta > 0 \Rightarrow 25 - 4m^2 > 0 \Rightarrow -\frac{5}{2} < m < \frac{5}{2} \quad (2)$$

$$(1) \cap (2) \rightarrow -\frac{5}{2} < m < 0$$

۲

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

$$p = \frac{3 + \sqrt{5}}{3} \times \frac{3 - \sqrt{5}}{3} = \frac{9 - 5}{9} = \frac{4}{9} \quad (2)$$

$$(1) \cap (2) \rightarrow 0 = x^2 - 3x + \frac{4}{9} \xrightarrow{\times 9} 9x^2 - 11x + 4 = 0$$

۳

$$\begin{cases} \alpha + \beta = \frac{1}{4} = 4 \Rightarrow \beta = 4 - \alpha \Rightarrow 3\alpha^2 + (4 - \alpha)^2 = 12 \rightarrow 4\alpha^2 - 11\alpha + 4 = 0 \quad (1) \\ \alpha\beta = \frac{m+2}{2} \quad (2) \end{cases}$$

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

$$(2) \cap (3) \rightarrow \frac{m+2}{2} = 3 \times 1 \Rightarrow m = 4$$

۴

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

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

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

۵

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

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

2) حل: $\alpha = \sqrt{q} \Rightarrow \beta = \frac{V}{\sqrt{q}} - \sqrt{q} = \frac{-V}{\sqrt{q}} \times$

$$\textcircled{1} \textcircled{2} \rightarrow \frac{1}{\alpha} + \frac{1}{\beta} = \frac{1}{-\sqrt{q}} + \frac{1}{\frac{V}{\sqrt{q}}} = \frac{V}{q} \rightarrow \boxed{\frac{V}{q}}$$

$$\begin{aligned} \alpha + \beta &= -m, \alpha\beta = -r \\ \alpha &= -m - \beta \Rightarrow \alpha^2 = -m\alpha + r \xrightarrow{\text{بالتعويض}} (-m - \beta) - m\beta = 1 \Rightarrow -m(\alpha + \beta) + r = 1 \\ \Rightarrow m^2 + r - 1 &= 0 \Rightarrow (m+1)(m-1) = 0 \rightarrow m = 1 \text{ أو } -1 \\ \alpha + \beta &= -m \xrightarrow{m=1} \alpha + \beta = -1 \\ &\xrightarrow{m=-1} \alpha + \beta = 1 \end{aligned}$$

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

$$\frac{-r}{m} + \frac{m}{r} + V = 1 \Rightarrow m^2 - r - 1 = 0 \Rightarrow (m-1)(m+1) = 0 \Rightarrow m = 1 \text{ أو } -1$$

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

$$\text{عند } (1, 4) \Rightarrow y = a(x-1)^2 + 4 \xrightarrow{\text{بالتعويض}} 4 = a(0-1)^2 + 4 \Rightarrow 4a + 4 = 4 \rightarrow a = -\frac{1}{r}$$

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

$$\left. \begin{aligned} \frac{1}{x_1} + \frac{1}{x_2} &= \frac{x_1 + x_2}{x_1 x_2} \Rightarrow 2 + \sqrt{r} + 2 - \sqrt{r} = \frac{4}{r} \\ &\Rightarrow (2 + \sqrt{r})(2 - \sqrt{r}) = 4 - r = 1 \end{aligned} \right\} \frac{1}{x_1} + \frac{1}{x_2} = \frac{4}{r} = \frac{4}{1} = 4$$

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

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

$$a = \frac{r \pm \sqrt{(-r)^2 - 4(r)(-1)}}{2 \times r} = \frac{r \pm r}{4} \rightarrow a = 1 \text{ أو } -\frac{1}{r}$$

$$a = 1 \xrightarrow{\text{بالتعويض}} x_2 = 4(1) + 4 = 8$$

$$a = -\frac{1}{r} \xrightarrow{\text{بالتعويض}} x_2 = 4\left(-\frac{1}{r}\right) + 4 = \frac{4}{r}$$