

$y = ax^2 + bx + c$ $\xrightarrow{\text{نقطه داده شده}}$ $(-1, 9)$ و $(3, 1)$
 $(h, k) \rightarrow y = a(x-h)^2 + k \rightarrow h = -1, k = 9 \rightarrow y = a(x+1)^2 + 9$
 $1 = a(3+1)^2 + 9 \rightarrow -8 = 16a \rightarrow a = -\frac{1}{2}$
 $\rightarrow -\frac{1}{2}x^2 - x + \frac{17}{2} \xrightarrow{\text{مکمل}}$ $y = -\frac{1}{2}x^2 - x + \frac{17}{2}$ $\rightarrow$ جواب.

(۲)
۱

$2x^2 + mx + m + 4 = 0$ $\xrightarrow{+2x^2}$ $\frac{-b}{a} > 0 \rightarrow \frac{-m}{2} > 0 \rightarrow m < 0$
 $\frac{c}{a} > 0 \rightarrow \frac{m+4}{2} > 0 \rightarrow m > -4$
 $\Delta > 0 \rightarrow m^2 - 4(m+4) = m^2 - 4m - 16 > 0 \rightarrow (m-12)(m+4) > 0$
 $\rightarrow m < -4$ یا $m > 12$
 $\rightarrow -4 < m < -4$ $\rightarrow$ جواب.

(۲)
۲

$2x^2 + (2m-1)x + 2-m = 0$ $\frac{-a}{b} = \frac{c}{a} \rightarrow \frac{-2}{2m-1} = \frac{2-m}{2} \rightarrow -4 = (2m-1)(2-m)$
 $-4 = (4m - 2m^2 - 2 + m) \rightarrow -4 = -2m^2 + 5m - 2 \rightarrow m^2 + 2m - 1 = 0$
 $\rightarrow (m+2)(m-1) \rightarrow m = -2$ یا $m = 1$
 $\rightarrow m = -1$ $\rightarrow$ جواب.

(۲)
۳

$x = x^2 - \epsilon \rightarrow x^2 - x - \epsilon = 0 \rightarrow S = \frac{-b}{a} = D, P = \frac{c}{a} = -\epsilon$
 $S = x_1^2 + x_2^2 + \frac{1}{x_1} + \frac{1}{x_2} = (S^2 - 2PS) + \frac{x_1^2 + x_2^2}{x_1 x_2} \Rightarrow S = 1 - 2x_1 x_2 (-\epsilon) + \frac{1}{-\epsilon} = 1 - \frac{2}{\epsilon}$
 $= \frac{1}{\epsilon} \Rightarrow P = (x_1^2 x_2^2) + \frac{1}{x_1 x_2} + x_1^2 + x_2^2 = -4\epsilon - \frac{1}{\epsilon} + 9 \rightarrow -2\epsilon - \frac{1}{\epsilon} = \frac{-221}{\epsilon}$
 $S = \frac{1}{\epsilon} \Rightarrow P = -\frac{221}{\epsilon} \Rightarrow x^2 - Sx + P = 0 \rightarrow x^2 - \frac{1}{\epsilon}x - \frac{221}{\epsilon} = 0$
 $\epsilon x^2 - x - 221 = 0$ $\rightarrow$ جواب.

(۲)
۴

$(\sqrt{x} + \frac{1}{\sqrt{x}} + 1)(\sqrt{x} - 1) = 2\sqrt{x} \Rightarrow \sqrt{x} = t \rightarrow x = t^2$
 $(t + \frac{1}{t} + 1)(t - 1) = 2t \rightarrow \frac{(t^2 + t + 1)(t - 1)}{t} = 2t$
 $t^3 - 2t^2 - 1 = 0 \xrightarrow{t=t^2} x^2 - 2x - 1 = 0 \xrightarrow{S} x_1 + x_2 = \frac{-b}{a} = 2$ $\rightarrow$ جواب.

(۲)
۵

$$x^2 - ax + \varepsilon = 0 \xrightarrow{\text{ریشه ها}} \alpha \text{ و } \mu\alpha$$

$$S = \frac{a}{\mu} = \varepsilon\alpha$$

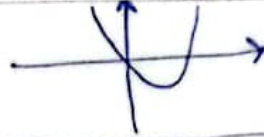
$$P = \alpha\alpha\mu\alpha = \mu\alpha^2 = \frac{\varepsilon}{\mu} \rightarrow \alpha^2 = \frac{\varepsilon}{\mu} \rightarrow \alpha = \pm \frac{\sqrt{\varepsilon}}{\mu}$$

$$\left. \begin{aligned} S = \varepsilon\alpha = \frac{a}{\mu} \rightarrow \varepsilon \times \frac{\sqrt{\varepsilon}}{\mu} = \frac{1}{\mu} = \frac{a}{\mu} \rightarrow a = 1 \\ \varepsilon\alpha = \frac{1}{\mu} = \frac{a}{\mu} \rightarrow a = -1 \end{aligned} \right\} \rightarrow 1 - (-1) = 2 \text{ جواب}$$

$$y = ax^2 + (\mu + \mu a)x \rightarrow \text{چون نداریم از مبدای گذر}$$

$$a > 0$$

$$x = -\frac{\mu a + \mu}{a} > 0 \rightarrow \frac{-\mu}{a} < 0 \rightarrow a < 0 \rightarrow \text{بسیار از این هیچ مقدار}$$



$$y = x^2 + ax - 2, y = -x^2 - \mu x + b \xrightarrow{\text{مقادیر برابر}} \frac{-a}{\mu} = -1 \rightarrow -a = -\mu \rightarrow a = \mu$$

$$\left\{ \begin{aligned} x^2 + ax - 2 = 1 \\ -x^2 - \mu x + b = 1 \end{aligned} \right\} \rightarrow \mu - b = 2 \rightarrow b = \varepsilon \quad ab = \mu \varepsilon = 1 \text{ جواب}$$

$$\left\{ \begin{aligned} x^2 - ax + b = 0 \\ \mu ax^2 + ax - 4 = 0 \end{aligned} \right\} \quad \begin{aligned} \alpha + \beta &= \frac{-b}{a} = \frac{-4}{\mu a} = \frac{-1}{\mu} \\ \alpha\beta &= \frac{c}{a} = \frac{-4}{\mu a} = \frac{-1}{\mu} \end{aligned} \rightarrow \alpha + \beta + 1 = \frac{a}{\mu} = \frac{1}{\mu} \rightarrow a = 1$$

$$(\alpha + 0/\omega)(\beta + 0/\omega) = \frac{c}{a} = \frac{b}{\mu} \rightarrow \alpha\beta + 0/\omega(\alpha + \beta) + 0/\mu\omega = \frac{b}{\mu} \rightarrow -\mu\omega + 0/\mu\omega = \frac{b}{\mu} \rightarrow b = -4 \rightarrow \left[\frac{ab}{\varepsilon} \right] = \left[\frac{(1)(-4)}{\varepsilon} \right] = \left[\frac{-4}{\varepsilon} \right] = -2 \text{ جواب}$$

$$\left\{ \begin{aligned} x^2 + 4x + m = 0 \xrightarrow{x = -m} (-m)^2 - 4m + m = 0 \rightarrow (-m)^2 - 3m = 0 \rightarrow m(m - 3) = 0 \\ x^2 + 2x - 3m = 0 \rightarrow x^2 + 4x + 4 = 0 \rightarrow (x + 2)^2 = 0 \rightarrow x = -2 \end{aligned} \right.$$

$$- \varepsilon x - \varepsilon m = 0 \rightarrow x = -m \quad x^2 + 2x - 1\omega = 0 \rightarrow (x + \omega)(x - \omega) = 0 \rightarrow \begin{cases} x = -\omega \\ x = \omega \end{cases}$$

$$m = 0 \text{ و } \omega = 3$$

$$m, \omega$$

$$1$$