

ext | $-1 \Rightarrow \frac{b}{1a} \Rightarrow 1a = b$
 $\Rightarrow \frac{4}{1a} = \frac{-b^2 + 1ac}{1a} = \frac{-1a^2 + 1ac}{1a} \Rightarrow -a + c = 9 \Rightarrow \cancel{c = a + 9}$

$y = ax^2 + bx + c \Rightarrow 1 = 9a + 1b + c \Rightarrow 9a + 1b + c - 1 = 0 \Rightarrow 1a + c - 1 = 0 \Rightarrow -1a + c = 1$
 $b = 1a \Rightarrow c = a + 9 \Rightarrow$

$\Rightarrow a = \frac{-1a}{1a} = -1 \Rightarrow b = 1a = -1 \Rightarrow c = a + 9 = -1 + 9 = 8$
 ~~$y = -1x^2 - 1x + 8$~~
 $y = -\frac{1}{4}x^2 - x + 1, 25$

$4) a \Rightarrow b^2 - 1ac > 0 \Rightarrow m^2 - (1)(1)(m+9) > 0 \Rightarrow m^2 - 1m - 9 > 0$
 $\Rightarrow (m-1)(m+9) > 0 \Rightarrow \frac{-1}{+0} \frac{1}{-9} \Rightarrow m < -9 \text{ or } m > 9$
 $\frac{c}{a} > 0 \Rightarrow \frac{m+9}{1} > 0 \Rightarrow m > -9$
 $\Rightarrow m > -9 \text{ and } m > 9 \Rightarrow m > 9$

$s = \frac{1}{p} = \frac{-b}{a} = \frac{q}{c} \Rightarrow -bc = a^2 \Rightarrow -(1m-1)(1-m) = 9 \Rightarrow 1m^2 - 2m - 1 = 0$

$\Rightarrow m = -1 \rightarrow \Delta < 0 \quad \times$
 $m = \frac{1}{1} \rightarrow \Delta > 0 \quad \checkmark$

$$x^2 - x - 1 = 0 \rightarrow S = -\frac{b}{a} = 1 = x_1 + x_2$$

$$\rightarrow P = \frac{c}{a} = -1 \rightarrow x_1 \cdot x_2$$

$$S' = x_1^3 + x_2^3 + \frac{1}{x_1} + \frac{1}{x_2} \rightarrow x_1^3 + x_2^3 + \frac{x_1 + x_2}{x_1 x_2} = S^3 - 3SP + \frac{S}{P} = 1 + 1 + \frac{1}{-1}$$

$$P' = \left(x_1^3 + \frac{1}{x_2}\right) \left(x_2^3 + \frac{1}{x_1}\right) = x_1^3 x_2^3 + x_1^3 + x_2^3 + \frac{1}{x_2 x_1} = P^3 + S' - 3P + \frac{1}{P}$$

$$= -9 + 1 + 1 + \frac{1}{-1} = -9 - 1 = -10$$

$$y = x^2 - S'x + P' = x^2 - \left(1 - \frac{1}{-1}\right)x - 10 = x^2 - \frac{0}{-1}x - \frac{10}{-1}$$

$$\begin{aligned}
 (\sqrt[3]{x^2} + \frac{1}{\sqrt[3]{x^2}} + 1)(\sqrt[3]{x^2} - 1) &= 2\sqrt[3]{x} \Rightarrow (\sqrt[3]{x^2} + \frac{1}{\sqrt[3]{x^2}} + 1)(\sqrt[3]{x^2} - 1)(\sqrt[3]{x^2}) \\
 &= 2\sqrt[3]{x}(\sqrt[3]{x^2}) \Rightarrow (\sqrt[3]{x^2} + 1 + \sqrt[3]{x^2}) / (\sqrt[3]{x^2} - 1) = 2x \\
 \Rightarrow x^2 - 1 &= 2x \Rightarrow x^2 - 2x - 1 = 0 \Rightarrow \Delta = \frac{b^2}{a} = 4
 \end{aligned}$$

$$\begin{aligned}
 \text{المقدّمات معادله} &= x_1, x_2 \quad x_2 = 3x_1 \rightarrow x_1 + x_2 = \frac{-b}{a} = 4x_1 = \frac{a}{\mu} \Rightarrow a = 12x_1 \\
 \rightarrow x_1 \times x_2 &= 3x_1^2 = \frac{c}{a} = \frac{4}{\mu} \Rightarrow 9x_1^2 = 4 \Rightarrow 9x_1^2 - 4 = 0 \Rightarrow (3x_1 - 2)(3x_1 + 2) = 0 \\
 \Rightarrow x_1 &= \frac{2}{3}, \frac{-2}{3} \Rightarrow a = 12 \times \frac{2}{3} = 8, \quad a = 12 \times \frac{-2}{3} = -8 \Rightarrow \text{اختلاف} = \boxed{16}
 \end{aligned}$$

یکی از ریشه ها صفر است $\Rightarrow a > 0$

$$s = -\frac{b}{a} > 0 \Rightarrow -\frac{(3+2a)}{a} > 0 \Rightarrow \frac{-3}{a} > 0$$

$$a \in \left[-\frac{3}{2}, 0\right)$$

$$\frac{-3}{a} > 0$$

$$\frac{-b}{2a} = \frac{2}{-2} = \frac{-a}{2} \Rightarrow a = 2$$

$$y = x^2 + ax - 2 \Rightarrow 1 = x^2 + 2x - 2 \Rightarrow x^2 + 2x - 3 = 0 \Rightarrow (x-1)(x+3) = 0 \Rightarrow \begin{matrix} x=1 \\ x=-3 \end{matrix}$$

$$y = -x^2 - 2x + b \Rightarrow 1 = -x^2 - 2x + b \Rightarrow 1 = -1 - 2 + b \Rightarrow b = 4$$

$$x = -3 \Rightarrow 1 = -9 + 6 + b \Rightarrow b = 4 \rightarrow ab = 1$$

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$$2x^2 - ax + b \Rightarrow \text{مستقیم} = \alpha, \beta$$

$$2ax^2 + ax - 4 = 0 \Rightarrow \alpha', \beta' \rightarrow \alpha + \beta = \alpha' + \beta' + 1 \Rightarrow \frac{-(-a)}{2} = \frac{-a}{2} + 1$$

$$\Rightarrow \frac{a}{2} = \frac{-1}{2} + 1 \Rightarrow a = 1$$

$$\alpha \times \beta = \left(\alpha' + \frac{1}{2}\right) \left(\beta' + \frac{1}{2}\right) = \alpha' \beta' + \frac{1}{2}(\alpha' + \beta') + \frac{1}{4} = -3 + \frac{1}{2} \times \frac{-1}{2} + \frac{1}{4} = -3$$

$$\Rightarrow \frac{b}{2} = -3 \Rightarrow b = -6 \rightarrow \left[\frac{ab}{2}\right] = \left[\frac{-6}{2}\right] = -3$$

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$$\text{مستقیم} = 2 \rightarrow r^2 + 2r - 3m = 0 \Rightarrow r^2 + 2r + 3r^2 + 11r = 0 \Rightarrow 4r^2 + 13r = 0$$

$$r^2 + 4r + m = 0 \Rightarrow m = -r^2 - 4r$$

$$\Rightarrow r = 0 \times$$

$$\Rightarrow r = -\omega \checkmark$$

$$\Rightarrow x^2 + 4x + m = 0 \Rightarrow 2\omega - 3\omega + m = 0 \Rightarrow m = \omega$$

$$\Rightarrow x^2 + 4x + \omega = 0 \Rightarrow (x+\omega)(x+1) = 0 \Rightarrow x = -\omega, -1$$

$$\rightarrow x^2 + 2x - 1\omega = 0 \Rightarrow (x+\omega)(x-\omega) = 0 \Rightarrow x = -\omega, +\omega$$

$$3 - (-1) = \boxed{4}$$

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