

$$a(x-h)^2+k \quad h=-1 \quad k=9 \quad y=a(x+1)^2+9 \quad (1)$$

$$y = -\frac{1}{4}(x+1)^2+9$$

$$1 = a(x+1)^2+9$$

$$1 = 16a+9 \rightarrow 16a = -8 \quad a = -\frac{1}{2}$$

$$y = -\frac{1}{4}x^2 - x + \frac{17}{4} \rightarrow y = -\frac{1}{4}(x+1)^2+9$$

$$\Delta > 0 \rightarrow b^2 - 4ac > 0 \quad m^2 - 4(2)(m+6) = m^2 - 8m - 48 > 0 \quad (2)$$

$$(m+4)(m-12) > 0 \quad \begin{array}{c} -4 \quad 12 \\ + \quad - \quad + \end{array} \quad m < -4 \quad m > 12 \rightarrow \begin{array}{l} \text{اگر عددی باشد} \\ \text{ممتنع نباشد} \\ \text{اگر عددی نباشد} \\ \text{ممتنع نباشد} \end{array}$$

$$x_1 + x_2 = -\frac{b}{a} = -\frac{m}{4} > 0 \quad m < 0 \quad (2)$$

$$x_1 x_2 = \frac{c}{a} = \frac{m+6}{4} > 0 \quad m > -6 \quad (3)$$

$$(1) \cap (2) \cap (3) \rightarrow -6 < m < -4 \quad (-6, -4) \rightarrow \begin{array}{l} \text{اگر عددی باشد} \\ \text{ممتنع نباشد} \end{array}$$

$$3x^2 + (2m-1)x + 2 - m = 0$$

$$-\frac{2m+1}{3} = \frac{3}{2-m}$$

$$\Delta = 25 + 44 = 69$$

$$S = \frac{2m+1}{3} \quad P = \frac{2-m}{3}$$

$$(2m+1)(2-m) = 9$$

$$m = \frac{5 \pm 9}{4}$$

$$S = \frac{1}{P}$$

$$2m^2 - 4m + 2 = 9$$

$$2m - 4m - 7 = 0$$

$$m = \frac{5}{4} / m = -1$$

$$\Delta \geq 0 \quad (2m-1)^2 - 4(2)(2-m) \geq 0$$

$$x^2 - x - 4 = 0$$

$$y_1 + y_2 = (x_1^3 + x_2^3) + \left(\frac{1}{x_1} + \frac{1}{x_2}\right) = S^3 - 3SP + \frac{S}{P} = \frac{51}{4} \quad (4)$$

$$x_1 + x_2 = -\frac{b}{a} = 1$$

$$y_1 y_2 = \left(x_1^3 + \frac{1}{x_1}\right) \left(x_2^3 + \frac{1}{x_2}\right) = (x_1 x_2)^3 + x_1^2 + x_2^2 + \frac{1}{x_1 x_2} = P^3 + S^2 - 2AP + \frac{1}{P}$$

$$x_1 x_2 = \frac{c}{a} = -4$$

$$= -\frac{221}{4}$$

$$y_1, y_2 \rightarrow \text{ریشه جدید}$$

$$x^2 - S'x + P' = x^2 - \frac{51}{4}x - \frac{221}{4} = \left(x^2 - \frac{51}{4}x - \frac{221}{4}\right)$$

$$\sqrt[3]{x} = t \rightarrow (t^3 - 1) \left(t^3 + \frac{1}{t^3} + 1\right) = 2t \rightarrow t^6 - \frac{1}{t^3} = 2t \rightarrow t^9 - \frac{1}{t^3} - 2t = 0 \rightarrow t^6 - 2t^3 - 1 = 0 \quad (5)$$

$$t^3 = m \rightarrow m^2 - 2m - 1 = 0 \rightarrow m_1, m_2 = 1 \pm \sqrt{2} \rightarrow t^3 = 1 \pm \sqrt{2}$$

$$\Delta = 4 + 4 = 8$$

$$\sqrt[3]{x} = t \Rightarrow t^3 = x \Rightarrow x_1, x_2 \Rightarrow \left[1 + \sqrt{2}, 1 - \sqrt{2}\right]$$

کدام ریشه

②

$$3x^2 - ax + 5 = 0$$

$$x_1, x_2 = 3x_1$$

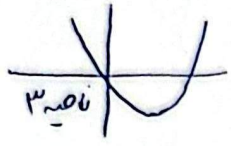
$$x_1 + x_2 = \frac{a}{3} = x_1 + 3x_1 = \frac{a}{3} = 4x_1 \rightarrow a = 12x_1$$

$$x_1 x_2 = \frac{5}{3} = x_1 \times 3x_1 = \frac{5}{3} = 3x_1^2 \rightarrow x_1^2 = \frac{5}{9} \rightarrow x_1 = \pm \frac{\sqrt{5}}{3}$$

$$\begin{cases} x_1 = \frac{\sqrt{5}}{3} \rightarrow a = 12 \times \frac{\sqrt{5}}{3} = 4\sqrt{5} \\ x_2 = -\frac{\sqrt{5}}{3} \rightarrow a = 12 \times (-\frac{\sqrt{5}}{3}) = -4\sqrt{5} \end{cases}$$

$$|1 - (-1)| = \boxed{2} \checkmark$$

⑦



$$\textcircled{1} a > 0 \Rightarrow \textcircled{1} \cap \textcircled{2} = \emptyset \rightarrow \text{هیچ مقداری نیست}$$

$$\textcircled{2} \frac{-b}{a} > 0 \Rightarrow \frac{-3-2a}{a} > 0 \Rightarrow \frac{-3}{a} > 0 \Rightarrow (-\frac{3}{a} > 0)$$

$$\textcircled{3} \Delta > 0 \Rightarrow (3+2a)^2 > 0 \rightarrow \text{همواره برقرار}$$

①

$$y = x^2 + ax - 2 \rightarrow \text{محور تقاطع} = x = \frac{-b}{2a} = -\frac{a}{2}$$

$$y = -x^2 - 2x + b \rightarrow \text{محور تقاطع} \rightarrow x = -1$$

$$-\frac{a}{2} = -1 \quad \frac{a}{2} = 1 \quad a = 2$$

$$\textcircled{1} y = x^2 + ax - 2 \rightarrow y = 1 \rightarrow x^2 + 2x - 2 = 1 \rightarrow x^2 + 2x - 3 = 0 \quad x = \frac{-2 \pm \sqrt{4}}{2} = -3/1$$

$$\textcircled{2} y = -x^2 - 2x + b \rightarrow y = 1 \rightarrow -x^2 - 2x + b = 1 \rightarrow -x^2 - 2x + b - 1 = 0 \rightarrow x^2 + 2x - b + 1 = 0$$

$$\text{محور تقاطع} \rightarrow x = -1 \rightarrow |1 - (-1)| = 2$$

$$|-3 - (-1)| = 2 \rightarrow \text{دو نقطه فاصله مساوی از } x = -1 \text{ دارند}$$

$$x = 1 \rightarrow 1^2 + (2 \times 1) - b + 1 = 0 \rightarrow b = 4$$

$$ab = 2 \times 4 = \boxed{8} \checkmark$$

⑨

$$2x^2 - ax + b = 0 \rightarrow x_1, x_2 \rightarrow S = \frac{a}{2} \quad P = \frac{b}{2}$$

$$2ax^2 + ax - 4 = 0 \rightarrow y_1, y_2 \rightarrow S = -\frac{1}{2} \quad P = \frac{-4}{2}$$

$$x_1 = y_1 + \frac{1}{2} \quad x_2 = y_2 + \frac{1}{2}$$

$$x_1 + x_2 = y_1 + y_2 + 1 = \frac{a}{2} \rightarrow \frac{1}{2} = \frac{a}{2} \Rightarrow a = 1$$

$$x_1 x_2 = (y_1 + \frac{1}{2})(y_2 + \frac{1}{2}) = y_1 y_2 + \frac{1}{2}(y_1 + y_2) + \frac{1}{4} = -3 - \frac{1}{2} + \frac{1}{4} = -3$$

$$x_1 x_2 = \frac{b}{2} = -3 \rightarrow b = -6$$

$$\left[\frac{ab}{4} \right] = \left[\frac{-6}{4} \right] = \left[\frac{-3}{2} \right] = \boxed{-1.5} \checkmark$$

کتابنامه

(10)

کتابت

$\frac{1}{r} = r \rightarrow$
① $r^2 + 4r + m = 0$
② $r^2 + 4r - 3m = 0$

$4r + 4m = 0$
 $m = -r$

$r^2 + 4r - r = r^2 + 3r = 0$ $r \neq 0 \Rightarrow r = -3 \Rightarrow m = 3$

① $\rightarrow S = -4 \rightarrow$ جمع ریشه ها $\rightarrow$ ریشه دیگر $= -1$

② $\rightarrow S = -4 \rightarrow$ جمع ریشه ها $\rightarrow$ ریشه دیگر $= 3$

$|3 - (-1)| = \boxed{4}$ ✓