

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

$$\Rightarrow y = -\frac{1}{2}x^2 + x + 2 \Rightarrow y = \underbrace{\left(-\frac{1}{2}x + 2\right)}_{x_1 = 4} \underbrace{\left(\frac{1}{2}x + 1\right)}_{x_2 = -2} = 0$$

x	x ₁	x ₂
f(x)	مثبت	مثبت
	-	+

$$\left. \begin{aligned} y &= ax^2 + bx + c \\ y &= mx^2 - 5x + m \end{aligned} \right\} \Rightarrow m < 0$$

معادله ۲ ریشه متمایز دارد $\Delta > 0$

$$25 - 4m^2 > 0 \Rightarrow m^2 < \frac{25}{4}$$

$$-\frac{5}{2} < m < \frac{5}{2}$$

$$\Rightarrow m = \left(-\frac{5}{2}, 0\right)$$

$$y = a(x^2 - 5x + p)$$

$$5 = x_1 + x_2 = \frac{3 + \sqrt{5} + 2 - \sqrt{5}}{2} = 2$$

$$p = x_1 x_2 = \left(\frac{3 + \sqrt{5}}{2}\right) \times \left(\frac{2 - \sqrt{5}}{2}\right) = \frac{1}{4}$$

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

برای صیغ کلی ضرایب
۱، ۲، ۳ در نظر بگیریم

$$\Rightarrow 9x^2 - 18x + 1$$

$$3\alpha^2 + \beta^2 = 12 \Rightarrow (\alpha^2 + \beta^2) + 2\alpha^2 = 12 \Rightarrow 12 - m + 2\alpha^2 = 12 \Rightarrow 2\alpha^2 = m$$

$$\left\{ \begin{aligned} S &= \frac{-b}{a} = \frac{5}{2} \\ P &= \frac{c}{a} = \frac{m+2}{2} \end{aligned} \right.$$

$$2x^2 - 18x + m + 2 = 0 \Rightarrow x_1, x_2 = \frac{18 \pm \sqrt{144 - 8m}}{4} = \frac{9 \pm \sqrt{36 - 2m}}{2}$$

$$\Rightarrow \alpha^2 = \frac{18 - 2m - 18\sqrt{36 - 2m}}{4} \Rightarrow 2\alpha^2 = 18 - m - 18\sqrt{36 - 2m}$$

$$m - 2 = 18 - m - 18\sqrt{36 - 2m} \Rightarrow 12 - 2m = 18\sqrt{36 - 2m} \Rightarrow (12 - 2m)^2 = 324(36 - 2m) \Rightarrow 4m^2 - 48m + 144 = 11916 - 648m \Rightarrow 4m^2 - 600m + 14072 = 0 \Rightarrow m^2 - 150m + 3518 = 0$$

$$\Rightarrow (m - 18)^2 = 0 \Rightarrow m = 18$$

$$m = 18 \Rightarrow 2x^2 - 18x + 4 = 0 \Rightarrow x^2 - 9x + 2 = 0 \Rightarrow \alpha = 1 \quad \beta = 3$$

5) $y = a(x - 2)^2 + 9 = ax^2 - 4ax + 4a + 9$ در فرض $\Delta = 0$ $\Rightarrow 16a^2 - 4(4a + 9) = 0 \Rightarrow 4a^2 - 4a - 9 = 0 \Rightarrow a = -1$

$$y = -x^2 + 4x + 5 = -(x + 5)(x - 1)$$

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-	+

در بازه (۱، ۵) بالا
سقطی قرار می گیرد

$$S = \frac{-b}{a}, \quad \frac{1}{\alpha} = \alpha + \beta \quad P = \frac{c}{a} = \frac{q\beta}{\alpha} = \alpha\beta \Rightarrow \frac{q}{\alpha} = \alpha \Rightarrow \alpha^2 = q \Rightarrow \alpha = \pm 3$$

$$\Rightarrow \begin{cases} \alpha = 3 \\ \alpha = -3 \end{cases} \quad \frac{1}{\alpha} = 3 + \beta \Rightarrow \beta = \frac{1}{\alpha} - 3 \quad \text{وقتی } \alpha = 3 \Rightarrow \beta = \frac{1}{3} - 3 = -\frac{8}{3}$$

$$\Rightarrow \frac{1}{\alpha} + \frac{1}{\beta} = \frac{1}{3} + \frac{3}{-8} = -\frac{1}{24} \neq \frac{1}{4}$$

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$$S = \frac{-b}{a} = -m \quad P = \frac{c}{a} = -2m$$

$$\alpha^2 - m\beta = 1 \Rightarrow \alpha^2 + (\alpha + \beta)(\beta) = 1 \Rightarrow (\alpha^2 + \beta^2) + \alpha\beta = 1 \Rightarrow S^2 - P = 1$$

$$S^2 - 2P = 1$$

$$m^2 + 2m = 1 \Rightarrow (m-1)(m+2) = 0 \Rightarrow m = -2 \Rightarrow x^2 - 2x + 1 = 0 \Rightarrow \Delta < 0 \quad \text{وقتی}$$

$$\hookrightarrow m = 1 \Rightarrow x^2 + 2x - 2 = 0 \Rightarrow S = -1$$

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$$S \mid \frac{-b}{a} \rightarrow \frac{-\Delta}{\Delta a} \rightarrow -\frac{14 - 2m^2 - 2\Delta m}{\Delta m} = 1 \Rightarrow 2m^2 + 2\Delta m - 14 = 2m^2 - 2\Delta m - 14 = 0 \Rightarrow m^2 - 2m - 7 = 0$$

$$\Rightarrow (m-1)(m+7) = 0 \Rightarrow m = -7 \quad f(x) = -2x^2 + 2x + 4$$

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$$f(x) = 0 \Rightarrow -2x^2 + 2x + 4 = 0 \Rightarrow x^2 - x - 2 = 0 \Rightarrow x_1 = -1, x_2 = 2$$

$$S \mid \frac{1}{4} \Rightarrow y = a(x-2)^2 + 4 \Rightarrow y = 4a + 4 = 4 \Rightarrow 4a = 0 \Rightarrow a = 0$$

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$$\Rightarrow y = -\frac{1}{4}(x^2 - 2x + 1) + 4 = -\frac{1}{4}x^2 + \frac{1}{2}x + \frac{15}{4} = x^2 - 2x - 1$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{S}{P} = \frac{L}{-1} = -\frac{1}{2}$$

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

$$\Rightarrow 4a^2 - 4a - 1 = 0 \Rightarrow a = 1 \Rightarrow x^2 - 8x + 12 = 0 \Rightarrow (x-4)(x-2) = 0 \Rightarrow x_1 = 4, x_2 = 2$$

$$\hookrightarrow a = -\frac{1}{4} \Rightarrow x^2 - \frac{1}{2}x + \frac{1}{4} = 0 \Rightarrow (x-1)(x-\frac{1}{2}) = 0 \Rightarrow x_1 = 1, x_2 = \frac{1}{2}$$

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