

$$y = (a-1)x^2 + x + 3 \rightarrow -\frac{b}{2a} = 2 \rightarrow -\frac{1}{2a-2} = 2$$

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

$$\text{ریشه ها} \rightarrow x = \frac{-1 \pm \sqrt{1+12}}{-\frac{1}{2}} \left\{ \begin{array}{l} x_1 = -2 \\ x_2 = 6 \end{array} \right. + \checkmark$$

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$$f(x) = mx^2 - 5x + m \quad \frac{x_1 \quad x_2}{-q \quad + \quad q \quad -}$$

ی نهم که m منفی است و معادله یک ریشه دارد. (چون قبل ریشه اول و بعد ریشه دوم موافق علامت m است.)

① $m < 0$

② $\Delta > 0 \rightarrow 25 - 4m^2 > 0 \rightarrow m^2 < \frac{25}{4} \rightarrow m < \frac{5}{2} \wedge m > -\frac{5}{2}$

① و ② $\rightarrow m = (-\frac{5}{2}, 0)$

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

$$\text{ضرب} = \frac{9-5}{4} = \frac{4}{4} = 1 \quad \text{جمع} = \frac{6}{2} = 3$$

$$\rightarrow \frac{c}{a} = \frac{4}{4} \quad , \quad -\frac{b}{a} = 2 \rightarrow y = x^2 - 5x + 4$$

$$\rightarrow y = x^2 - 2x + \frac{4}{4} \xrightarrow[\times 4]{\text{ضرایب صحیح}} y = 4x^2 - 11x + 4 = 0$$

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$$2x^2 - 11x + m + 2 = 0 \quad \beta > \alpha \quad 3\alpha^2 + \beta^2 = 12$$

$$\alpha + \beta = 5 \rightarrow \beta^2 + 3\alpha^2 = 12 \rightarrow 3(5-\beta)^2 + \beta^2 = 45 + 3\beta^2 - 30\beta + \beta^2 = 12$$

$$\alpha = 5 - \beta$$

$$\rightarrow 4\beta^2 - 30\beta + 34 = 0 \rightarrow 4(\beta-2)^2 = 0 \rightarrow \beta = 2 \quad , \quad \alpha = 1$$

$$\rightarrow y = 2x^2 - 11x + m + 2 = 2(x-2)(x-1) = 2x^2 - 11x + 4$$

$$\rightarrow m = 4$$

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ریشه ها را جمع خواهد.

$$S(2,9) \quad c = 9 \quad a < 0$$

$$y = a(x-k)^2 + h = a(x-2)^2 + 9 \xrightarrow[y=9]{x=0} 4a + 9 = 9$$

$$\rightarrow a = -1 \rightarrow y = -(x-2)^2 + 9 = -x^2 + 4x + 5$$

$$\text{ریشه ها} \rightarrow x = \frac{-4 \pm \sqrt{16+20}}{-2} \left\{ \begin{array}{l} x_1 = -1 \\ x_2 = 5 \end{array} \right. \rightarrow \text{بازه } (-1, 5)$$

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$$\alpha n^2 - \sqrt{3}n + 4\beta = 0 \quad \beta > 0 \quad \frac{1}{\alpha} + \frac{1}{\beta} = ?$$

$$p = \alpha\beta = \frac{4\beta^2}{\alpha} \rightarrow \alpha\beta = 4 \rightarrow \alpha = \frac{4}{\beta}$$

$$\rightarrow \alpha + \beta = \frac{\sqrt{3}}{\alpha} < \frac{\sqrt{3}}{\frac{4}{\beta}} = \frac{\sqrt{3}\beta}{4} \rightarrow \beta = -\frac{4}{\sqrt{3}} \quad \times$$

$$\rightarrow \alpha + \beta = \frac{\sqrt{3}}{\alpha} < -\frac{\sqrt{3}}{\frac{4}{\beta}} = -\frac{\sqrt{3}\beta}{4} \rightarrow \beta = \frac{4}{\sqrt{3}} \quad \checkmark$$

$$\rightarrow \frac{1}{\alpha} + \frac{1}{\beta} = -\frac{1}{\sqrt{3}} + \frac{\sqrt{3}}{4} = \frac{4 - \sqrt{3}}{4} = \frac{\sqrt{3}}{4}$$

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$$n^2 + mn - 2m = 0 \quad \alpha^2 - m\beta = \Delta \quad S = p = -m$$

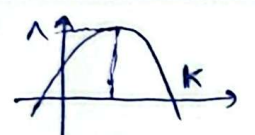
$$\rightarrow \alpha(-m - \beta) - m\beta = \Delta \rightarrow -\alpha\beta - m\alpha - m\beta = \Delta$$

$$\rightarrow 2m - m(\alpha + \beta) = \Delta \rightarrow m^2 + 2m - \Delta = 0 \quad \begin{cases} m = 2 \\ m = -4 \end{cases}$$

$$\Delta > 0 \rightarrow m^2 + 4m > 0 \quad \begin{cases} m = 2 \\ m = -4 \end{cases}$$

$$\rightarrow S = \alpha + \beta = -m = -2$$

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$$f(n) = mn^2 + 2n + \frac{m}{2} + \frac{1}{2}$$

$$-\frac{\Delta}{4a} = 1 \rightarrow -\frac{19 - 2m^2 - 2\Delta m}{4m} = 1$$

$$\rightarrow -19 + 2m^2 + 2\Delta m = 4m \rightarrow 2m^2 - 2m - 19 = 0$$

$$\rightarrow m^2 - m - 19 = 0 \quad \begin{cases} m = 2 \\ m = -17 \end{cases}$$

$$\text{ریشه ها} = \frac{-(-1) \pm \sqrt{1 + 76}}{-2} \quad \begin{cases} n_1 = -1 \\ n_2 = 2 \end{cases} \rightarrow k = 2$$

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$$\frac{1}{\alpha} + \frac{1}{\beta} = ?$$

$$a(n-2)^2 + 4 = 0 \quad \frac{n=0}{y=4} \rightarrow 4a + 4 = 4$$

$$\rightarrow a = -\frac{1}{4} \rightarrow -\frac{1}{4}n^2 + 2n + 4 < \begin{cases} S = 4 \\ P = -1 \end{cases}$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{4}{-1} = -4$$

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$$n^2 - (fa + f)n + (2a^2 + 4a + 3) = 0 \quad n_1 = 2$$

$$\text{جایگذاری} \rightarrow f - 1a - 1 + 2a^2 + 4a + 3 = 0 \rightarrow 2a^2 - 2a - 1 = 0$$

$$\text{ریشه ها} \rightarrow a = \frac{2 \pm \sqrt{4 + 8}}{4} < \begin{cases} 1 \\ -\frac{1}{2} \end{cases}$$

$$S = fa + f < \begin{cases} = 1 \\ = -\frac{f}{2} + f = \frac{f}{2} \end{cases} \rightarrow n_2 = 4$$

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