

$$x^2 + 2x + 3 = 0 \quad n_1 = 2n_2$$

$$S = \frac{-b}{a} = \frac{a}{x} = 2n_2 \rightarrow a = 12n_2 \begin{cases} n_1 = \frac{x}{2} \rightarrow a = 1 \\ n_2 = \frac{x}{2} \rightarrow a = -1 \end{cases}$$

$$P = \frac{c}{a} = \frac{3}{x} = 2n_2 \rightarrow n_2 = \frac{3}{2x} \rightarrow n_2 = \frac{3}{2} \cdot \frac{1}{x}$$

$$a_1, a_2 \text{ و } a_3 : 1, -1, 1 \rightarrow 1 - 1 + 1 = 1$$

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$$x^2 + 2x + 3 = 0 \quad \sqrt{\frac{1}{a}} + \sqrt{\frac{1}{b}} = \omega \quad m \cdot x^2 + 2x + 3 = 0$$

$$\sqrt{\frac{1}{a}} + \sqrt{\frac{1}{b}} = \omega \quad \frac{1}{a} + \frac{1}{b} + \frac{2}{\sqrt{ab}} = \omega^2$$

$$S = \frac{m+1}{2} \quad P = \frac{1}{4}$$

$$\frac{m+1}{2} + \frac{1}{4} = \omega \rightarrow m+1+\frac{1}{2} = 2\omega \rightarrow m = -1$$

$$\rightarrow -2x + 2x + 3 = 0$$

$$P = \frac{c}{a} = \frac{3}{-1} = -3$$

سوال 2

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$$x^2 + 2x + 3 = 0 \quad \alpha/\beta = 1, \alpha/\beta = -2$$

$$\alpha, \beta \Rightarrow x^2 - 5x + 6 = 0 \rightarrow (x-2)(x-3) = 0 \quad \begin{matrix} x = -1 \\ x = 2 \end{matrix}$$

$$x = -1 \rightarrow \begin{cases} (-1)^2 + 2(-1) + 3 = 0 \\ -1 + 2 + 3 = 4 \end{cases} \rightarrow K = -4$$

سوال 3

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$$x^2 + 4x + a = 0 \quad \alpha < \beta < 0 \quad \sqrt{\alpha} + \sqrt{\beta} = 12\sqrt{2} + 18\omega$$

$$\rightarrow \frac{-4 - \sqrt{16-4a}}{2} = -2 - \sqrt{4-a}, \quad \frac{-4 + \sqrt{16-4a}}{2} = -2 + \sqrt{4-a}$$

$$\alpha < \beta \rightarrow \alpha = -2 - \sqrt{4-a}, \beta = -2 + \sqrt{4-a}$$

$$\sqrt{\alpha} + \sqrt{\beta} = 12\sqrt{2} + 18\omega$$

$$\sqrt{\alpha} = \sqrt{-2 - \sqrt{4-a}}, \sqrt{\beta} = \sqrt{-2 + \sqrt{4-a}}$$

$$\sqrt{\alpha} + \sqrt{\beta} = 12\sqrt{2} + 18\omega \rightarrow a = 1$$

سوال 4

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$$x^2 - 2x + 3 = 0 \quad x^2 - 2x + 3 = 0$$

$$x^2 - 2x + 3 = 0 \rightarrow t^2 - 2t + 3 = 0 \rightarrow t = \frac{2 \pm \sqrt{4-12}}{2} = 1 \pm i\sqrt{2}$$

$$n_1 = \sqrt{\frac{2 + i\sqrt{2}}{2}}, \quad n_2 = \sqrt{\frac{2 - i\sqrt{2}}{2}}$$

$$P = n_1 n_2 = -\left(\sqrt{\frac{2 + i\sqrt{2}}{2}}\right) \sqrt{\frac{2 - i\sqrt{2}}{2}} = -\frac{2 - 2i\sqrt{2}}{2} = -1 + i\sqrt{2}$$

$$S = n_1 + n_2 = \sqrt{\frac{2 + i\sqrt{2}}{2}} + \sqrt{\frac{2 - i\sqrt{2}}{2}} = 0$$

$$x^2 - 2x + 3 = 0 \rightarrow \sqrt{\frac{2 - i\sqrt{2}}{2}} = \sqrt{\frac{2 + i\sqrt{2}}{2}} = \omega \sqrt{2} + \sqrt{2}$$

سوال 5

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$$\textcircled{1} x^2 - ax + b = 0 \rightarrow \alpha + \frac{1}{\beta} + \frac{1}{\alpha} = \frac{b}{a}, \quad \textcircled{2} x^2 + ax - 4 = 0 \rightarrow \alpha + \frac{1}{\beta} = \frac{-a}{2}, \quad \left[\frac{ab}{x}\right]$$

$$\textcircled{2} \Rightarrow \alpha + \beta = \frac{-a}{2}, \quad \frac{-a}{2\alpha} = \frac{-1}{\alpha} \rightarrow \alpha/\beta = \frac{c}{a} = \frac{-4}{2a} = \frac{-2}{a}$$

$$\textcircled{1} \Rightarrow \alpha + \frac{1}{\beta} + \beta + \frac{1}{\alpha} = \alpha + \beta + 1 + \frac{a}{\beta} \rightarrow \frac{-1}{\beta} + 1 + \frac{a}{\beta} \rightarrow \frac{1}{\beta} = \frac{a}{\beta} \rightarrow a = 1$$

$$(\alpha + \frac{1}{\beta})(\beta + \frac{1}{\alpha}) = \alpha\beta + \frac{1}{\alpha}(\alpha + \beta) + \frac{1}{\beta} = \frac{b}{a} \rightarrow \frac{-2}{a} + \frac{1}{\beta}(-\frac{1}{\beta}) + \frac{1}{\beta} = \frac{b}{a} \xrightarrow{a=1} -2 - \frac{1}{\beta} + \frac{1}{\beta} = \frac{b}{a} \rightarrow b = -4$$

$$\left[\frac{ab}{x}\right] \rightarrow \left[\frac{1(-4)}{x}\right] = \left[\frac{-4}{x}\right] = \left[-\frac{4}{x}\right]$$

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$$a^2 - a - b = 0$$

$$x_0/3 + y_0 x^2 - y/3 = 1 \quad |x-y|$$

سوال ۷

$$\rightarrow \alpha + \beta = \frac{-b}{a} = \frac{a}{a} = 1 \rightarrow \beta = 1 - \alpha$$

$$\rightarrow f_0(1-\alpha)^2 + y_0 x^2 - y_0(1-\alpha) = 1$$

$$y_0 x^2 - y_0 \alpha + y_0 = 1$$

$$y_0 x^2 - y_0 \alpha + y_0 = 0$$

$$y_0 x^2 - y_0 \alpha + 1 = 0 \rightarrow S = 1, P = \frac{1}{y_0}$$

$$|x-1| = \sqrt{S^2 - 4P} = \sqrt{1 - \frac{4}{y_0}} = \sqrt{\frac{y_0 - 4}{y_0}}$$

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$$\textcircled{1} x^2 - (a+1)x + a = 0 \rightarrow \text{دو عدد فرد متوالی : } x_1, x_2$$

$$\textcircled{2} x^2 - (3a+1)x + b = 0 \rightarrow \text{دو عدد زوج متوالی : } x_1, x_2$$

سوال ۸

$$\rightarrow n, n+2$$

$$S = n + n+2, \quad n+2 = a+1 \rightarrow a = n+1$$

$$P = n(n+2) = n^2 + 2n = a^2 \xrightarrow{a=n+1} n^2 + 2n = (n+1)^2$$

$$n^2 = 1 \rightarrow n = \pm 1$$

$$\text{سبب ریشه ها : } 1, 3 \rightarrow a = 2$$

$$\textcircled{3} \rightarrow 2k, 2k+2$$

$$S = 2k + 2 = 3a+1 \xrightarrow{a=3} 2k+2 = 10 \rightarrow k = 4$$

$$\text{ریشه ها : } 4, 6 \rightarrow b = 24$$

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$$\text{فاصله بین دو نقطه} = |(3 \times 1) - (4 \times 4)| = 13$$

$$x^2 + x - 1 - m^2 = 0 \quad x^2 + 3x = ?$$

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

$$a+b = -1 \rightarrow ab = -(1+m^2)$$

$$a^2 + b^2 = (a+b)^2 - 2ab \rightarrow (-1)^2 - 2(-(1+m^2)) = 1 + 2m^2$$

کمترین مقدار وقتی است که $m^2 = 0$ سبب داریم :

$$1 + 2m^2 = \xrightarrow{m=0} 1 + 2(0)^2 = 1$$

سوال ۹

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$$f(x_0, y), \beta(-\omega, y) \quad \text{نقطه : } x_0, y$$

$$x^2 + 3x = \omega$$

سوال ۱۰

$$\rightarrow x_0 = \frac{3-\omega}{2} = -1$$

نقطه هم عرض است

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$$y = a(x-h)^2 + k \rightarrow y = a(x+1)^2 + 1 \rightarrow y = ax^2 + 2ax + a + 1 \quad S = -2, P = \frac{a+1}{a}$$

$$x^2 + 3x = \omega \rightarrow (\alpha + \beta)x^2 - 2\alpha\beta = \omega \rightarrow f - 2\left(\frac{a+1}{a}\right) = \omega$$

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

$$3a = -2 \rightarrow a = -\frac{2}{3}$$

$$\text{نقطه هم عرض} \Rightarrow a+1 = -\frac{2}{3} + 1 = \frac{1}{3}$$