

$$x^2 + 2x + 1 = 0 \quad n_1 = 2n_2$$

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

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

$$a_1, a_2, a_3 : 1, -1, 1 \rightarrow 1 - (-1) = 2$$

سوال ۱

$$x^2 + 2x + 1 = 0 \quad \sqrt{\frac{1}{a}} + \sqrt{\frac{1}{b}} = \omega \quad m, n, p, q, r, s, t, u, v, w, x, y, z$$

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

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

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

$$\rightarrow -2x + 4n + 1 = 0$$

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

سوال ۲

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

$$x^2 - 5x + 6 = 0 \rightarrow (x-2)(x-3) = 0 \rightarrow x = 2, x = 3$$

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

$$-1 + 2 + 1 = 2 \rightarrow 2 = 0$$

سوال ۳

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

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

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

$$\sqrt{\alpha} + \sqrt{\beta} = 12\sqrt{a} + 18$$

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$$90 - 18a + 4\sqrt{4 - a} = 12\sqrt{a} + 18 \rightarrow a = 1$$

سوال ۴

$$x^2 - 2x + 1 = 0 \quad x^2 - 2x + 1 = 0$$

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

$$n_1 = \sqrt{\frac{1+549}{4}}, n_2 = \sqrt{\frac{1-549}{4}}$$

$$P = n_1 n_2 = -\left(\sqrt{\frac{1+549}{4}}\right) \left(\sqrt{\frac{1-549}{4}}\right) = -\frac{1+549}{4}$$

$$S = n_1 + n_2 = \sqrt{\frac{1+549}{4}} - \sqrt{\frac{1-549}{4}} = 0$$

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

سوال ۵

$$\textcircled{1} x^2 - ax + b = 0 \rightarrow \alpha + \frac{1}{\beta} + \frac{1}{\alpha} = \frac{b}{a}, \textcircled{2} x^2 + ax - 4 = 0 \rightarrow \alpha + \frac{1}{\beta} = \frac{-4}{a}$$

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

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

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

$$\rightarrow b = -4$$

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

سوال ۶

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

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

سوال ۷

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

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

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

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

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

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

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

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

سوال ۸

$$L \quad n, n+2$$

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

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

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

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

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

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

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

$$\text{فاصله بین ریشه ها} = |(3 \times 1) - (4 \times 6)| = 21$$

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

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

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

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

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

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

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

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

سوال ۱۰

$$L \quad x_3 = \frac{3-\omega}{2} = -1$$

نقطه هم عرف است

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

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

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

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

$$\text{عرف اول} \Rightarrow a+1 = -\frac{2}{3} + 1 = \frac{1}{3}$$