

$$3n^2 + an + c = 0$$

سوال ۱:

$$\alpha = 3\beta \rightarrow \beta = \frac{\alpha}{3}$$

$$3\beta \times \beta = 3\beta^2 \quad 3\beta^2 = \frac{c}{3} \rightarrow \beta^2 = \frac{c}{9} = \frac{4}{9} \quad \alpha = 3 \times \frac{2}{3} = \boxed{\alpha = 2}$$

$$\frac{2}{3} + \frac{2}{3} = \frac{a}{3} \rightarrow \frac{4}{3} = \frac{a}{3} \rightarrow \underline{a = 4}$$

$$a_1 - a_2 = 4 - (-4) = 8$$

$$\beta = -\frac{2}{3} \rightarrow \alpha = -2 \quad -2 - \frac{2}{3} = \frac{a}{3} \rightarrow \underline{a_2 = -8}$$

$$34m^2 - (m+14)n + 1 = 0$$

سوال ۲:

$$\sqrt{\frac{1}{\alpha}} + \sqrt{\frac{1}{\beta}} = \omega \rightarrow \frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = \omega \rightarrow \frac{\sqrt{\beta} + \sqrt{\alpha}}{\sqrt{\alpha\beta}} = \omega$$

$$\alpha\beta = \frac{1}{34} \quad \alpha + \beta = \frac{m+14}{34} \quad \frac{\sqrt{\beta} + \sqrt{\alpha}}{\sqrt{\alpha\beta}} = \omega \rightarrow \sqrt{\beta} + \sqrt{\alpha} = \frac{\omega}{\sqrt{\alpha\beta}}$$

$$\beta, \alpha \text{ are roots of } x^2 - \frac{m+14}{34}x + \frac{1}{34} = 0 \rightarrow \frac{m+14}{34} = \frac{1}{\omega} \times \frac{12}{34} = \frac{12}{34}$$

$$m+14 = 12 \rightarrow \underline{m = -2}$$

$$m^2 + 3m + 2 = 0$$

$$\rightarrow -m^2 + 3m + 2 = 0 \rightarrow \underline{\frac{c}{a} = -2}$$

سوال ۳:

$$En^3 + kn^2 - 9m - 2 = 0 \quad \alpha\beta = -2 \quad \alpha + \beta = 1 \quad \left. \begin{array}{l} \alpha = 2 \\ \beta = -1 \end{array} \right\}$$

$$(\alpha + \beta)^2 = 1 \rightarrow \alpha^2 + \beta^2 + 2\alpha\beta = 1 \rightarrow \alpha^2 + \beta^2 = 5$$

$$6 \times (-1)^3 + k + 9 - 2 = 0 \rightarrow \boxed{k = -3} \checkmark$$

$$6 \times 1 + k - 11 - 2 = 0 \rightarrow k = 7 \checkmark$$

$$x^2 + 4x + a = 0 \quad \alpha < \beta < 0 \quad \alpha + \beta = -4$$

$$\alpha\beta = a$$

سوال ۴

$$x^2 + 4x + a = 0 \quad \alpha + \beta = -4$$

$$\alpha - \beta = \sqrt{16 - 4a} = \sqrt{4(4-a)} = 2\sqrt{4-a}$$

نکته

$$x^2 + 4x + a = 0 \quad \alpha + \beta = -4$$

$$\alpha + \beta + 2\alpha\beta = -4 \Rightarrow \alpha + \beta = -4 - 2a$$

$$4 - 4a + 4\sqrt{4-a} = -4 + 12\sqrt{4-a}$$

$$a = 1 \quad a - a = 0$$

$$a - a = 0 \Rightarrow a = 1$$

$$x^2 - vx + c = 0$$

$$\Delta = v^2 - 4c = 49$$

$$x = \frac{v \pm \sqrt{49}}{2} = \frac{v \pm 7}{2}$$

$$x = \frac{v \pm 7}{2}$$

$$x = \frac{v \pm 7}{2}$$

$$x^2 - vx + c = 0$$

$$S = 0 \quad P = \frac{-v - \sqrt{49}}{2}$$

$$x^2 - vx + c = 0 \Rightarrow \omega + v\sqrt{49}$$

$$x^2 - ax + b = 0$$

$$x^2 - ax + b = 0$$

سوال ۶

$$\alpha + \frac{1}{\alpha} + \beta + \frac{1}{\beta} = \frac{a}{r}$$

$$\alpha\beta = \frac{b}{r}$$

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

$$\left(\frac{1}{r} + \alpha\right)\left(\frac{1}{r} + \beta\right) = \frac{1}{r} + \left(\alpha + \beta\right)\frac{1}{r} + \alpha\beta = \frac{b}{r}$$

$$\frac{1}{r} + \frac{1}{r} - \frac{1}{r} = \frac{b}{r} \Rightarrow b = -4$$

$$\left[\frac{ab}{r}\right] = \left[\frac{1 \times -4}{r}\right] = \left[-\frac{4}{r}\right] = -4$$

Arman

$$am^2 - an - b = 0 \rightarrow \alpha, \beta \quad \text{عوض } \alpha^2 + 2\alpha\beta + \beta^2 = 1 \quad \text{سوال 7}$$

$$\alpha + \beta = 1 \quad \alpha\beta = -\frac{b}{a} \quad 2\alpha\beta + 2\alpha\beta + 2\alpha\beta + 2\alpha\beta = 1 \quad \text{عوض}$$

$$m^2 - m - \frac{b}{a} = 0 \rightarrow m^2 - m = \frac{b}{a} \quad 2\alpha(\beta^2 - \beta) + 2\alpha(\beta^2\alpha^2) = 1 \quad \text{عوض}$$

$$\beta^2 - \beta = \frac{b}{a} \quad 2\alpha\left(\frac{b}{a}\right) + 2\alpha\left(1 + \frac{b}{a}\right) = 1 \quad \text{عوض}$$

$$\alpha + \beta + 2\alpha\beta = 1 \rightarrow \alpha^2 + \beta^2 = 1 + \frac{b}{a} \quad 2\alpha + 4\alpha\frac{b}{a} = 1 \rightarrow 4\alpha\frac{b}{a} = -3 \rightarrow \frac{b}{a} = -\frac{3}{4} \rightarrow \frac{b}{a} = -\frac{1}{2}$$

$$\alpha - \beta = \frac{\sqrt{\Delta}}{|a|} = \sqrt{1 - \frac{4b}{a}} = \sqrt{1 - \frac{4(-\frac{1}{2})}{1}} = \sqrt{\frac{3}{1}} = \frac{\sqrt{3}}{1}$$

$$m^2 - (a+1)m + a = 0 \rightarrow \text{عوض } 2k+1, 2k-1 \quad \text{سوال 1}$$

$$m^2 - (2ka+1)m + b = 0 \rightarrow \text{عوض } 2k, 2k+2$$

$$a = 2k+1 \times 2k-1 = 4k^2 - 1 \quad \left\{ \begin{array}{l} 4k^2 - 1 = 0 \\ 4k(k-1) = 0 \end{array} \right. \quad a = 3$$

$$a+1 = 4k \rightarrow a = 4k-1 \quad \left\{ \begin{array}{l} 4k^2 - 1 = 0 \\ 4k(k-1) = 0 \end{array} \right. \quad k \geq 1, k \leq 0$$

$$b = 4k^2 + 4k \quad \text{عوض } a+1 = 4k+2$$

$$10 = 4k+2 \rightarrow k = 2 \rightarrow b = 24$$

$$|a-b| = |3-24| = 21$$

$$m^2 - (1+m^2)m + 1 = 0 \quad \alpha^2 + \beta^2 = \min$$

$$\alpha + \beta = -1 \rightarrow \alpha^2 + \beta^2 + 2\alpha\beta = 1$$

$$\alpha\beta = -(1+m^2) \quad \alpha^2 + \beta^2 + 2(1+m^2) = 1$$

$$\alpha^2 + \beta^2 - 2m^2 = 3$$

$$m=0$$

$$\alpha^2 + \beta^2 = 3$$

سوال 9

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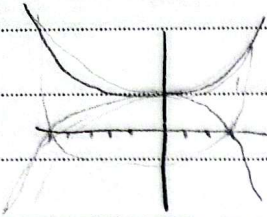
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$$B = (-\omega, \omega) \quad A(r, y)$$

سوال 10:



$$\frac{y-\omega}{r} = -1 \rightarrow y = -r + \omega$$

$$\alpha^r + \beta^r = \omega$$

$$y = a(n+1)^r + 1$$

$$0 = a(n^r + 1 + r n) + 1$$

$$0 = n^r a + a + r a n + 1$$

$$0 = a n^r + r a n + a + 1$$

$$\alpha + \beta = -\frac{r a}{a} = -r \rightarrow \alpha^r + \beta^r + r \alpha \beta = r$$

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

$$r \alpha \beta = -1 \rightarrow \alpha \beta = -\frac{1}{r}$$

$$y = -\frac{r}{r} (n+1)^r + 1$$

$$-\frac{1}{r} = 1 + \frac{1}{a}$$

$$-\frac{r}{r} = \frac{1}{a} \rightarrow a = -\frac{r}{r}$$

$$y = -\frac{r}{r} + 1 \Rightarrow y = \frac{1}{r} \quad n=0$$