

سوال ۱ (۲)

$$\mu n^2 - a n + r = 0 \quad \alpha = \mu \beta \quad \rho = a \cdot \beta = \mu \beta^2 \Rightarrow \mu \beta^2 = \frac{r}{\mu} \Rightarrow \beta^2 = \frac{r}{\mu} \Rightarrow \beta = \pm \frac{\sqrt{r}}{\sqrt{\mu}} \quad (۲)$$

$$S = \alpha + \beta = \frac{a}{\mu} \begin{cases} \beta = \frac{\sqrt{r}}{\sqrt{\mu}} & r(\frac{\sqrt{r}}{\sqrt{\mu}}) = \frac{a}{\mu} \Rightarrow a = 1 \\ \beta = -\frac{\sqrt{r}}{\sqrt{\mu}} & r(-\frac{\sqrt{r}}{\sqrt{\mu}}) = \frac{a}{\mu} \Rightarrow a = -1 \end{cases}$$

$|a_1 - a_2| = |1 - (-1)| = 2$ ✓

سوال ۲ (۲)

(۲)

$$\mu_5 n^2 - (m+1r)n + 1 = 0 \quad \frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = \omega$$

$$\frac{\sqrt{\alpha} + \sqrt{\beta}}{\sqrt{\alpha\beta}} = \omega \Rightarrow \frac{\sqrt{S+2\sqrt{P}}}{\sqrt{P}} = \omega \Rightarrow \begin{cases} S = \frac{m+1r}{\mu_5} \\ P = \frac{1}{\mu_5} \end{cases}$$

$$\frac{\sqrt{\frac{m+1r}{\mu_5} + \frac{1}{\mu_5}}}{\sqrt{\frac{1}{\mu_5}}} = \omega \quad \& \quad \sqrt{\frac{m+1r}{\mu_5}} = \omega \quad \sqrt{\frac{m+1r}{\mu_5}} = \frac{\omega}{\sqrt{\mu_5}}$$

$$\Rightarrow \frac{m+1r}{\mu_5} = \frac{\omega^2}{\mu_5} \Rightarrow m+1r = \omega^2 \Rightarrow m = \omega^2 - 1$$

$$m n^2 + \mu n + r = 0 \quad \rho = \frac{r}{m} = \frac{r}{-1} = -r \quad \checkmark$$

سوال ۳ (۲)

$$\mu_5 n^2 + k n^2 - 9n - r = 0 \quad \begin{cases} \alpha + \beta = 1 \rightarrow \alpha = -\beta + 1 \\ \alpha \beta = -r \rightarrow \beta(-\beta + 1) = -r \end{cases}$$

باجای α و β در معادله $n = \alpha \beta$ عو

$$r(1)^2 + k(-1)^2 - 9(-1) - r = 0$$

$$-r + k + 9 - r = 0 \rightarrow k = -r \quad \checkmark$$

$$\begin{aligned} -\beta^2 + \beta &= -r \\ \beta^2 - \beta - r &= 0 \\ (\beta - r)(\beta + 1) &= 0 \\ \begin{cases} \beta = r \rightarrow \alpha = -1 \\ \beta = -1 \rightarrow \alpha = r \end{cases} \end{aligned}$$

سوال ۴ (۱، ۵)

$$\mu n^2 + \epsilon n + a \quad \alpha < \beta < 0 \quad \mu \alpha^2 + \epsilon \beta^2 = 12\sqrt{r} + 1\omega = 3\sqrt{3r} + 1\omega$$

$$\alpha = \frac{-\epsilon - \sqrt{\epsilon^2 - 4\mu a}}{2\mu} \quad r(\alpha^2 + \beta^2) + \alpha^2 = 12\sqrt{r} + 1\omega \Rightarrow r(S^2 - 2P) + \alpha^2 = 12\sqrt{r} + 1\omega$$

$$r(\mu_5 - 2a) + \left(\frac{-\epsilon - \sqrt{\epsilon^2 - 4\mu a}}{2\mu} \right)^2 = 12\sqrt{r} + 1\omega \Rightarrow \sqrt{r} - 2a + \frac{\mu_5 + \mu_5 - 2a + 12\sqrt{\mu_5 - 2a}}{4} =$$

$$\Rightarrow \sqrt{r} - 2a + \frac{\sqrt{r} - 2a + 12\sqrt{\mu_5 - 2a}}{4} = \sqrt{r} - 2a + \frac{\sqrt{r} - 2a}{4} + 3\sqrt{\mu_5 - 2a} = 3\sqrt{3r} + 1\omega$$

$$\Rightarrow \mu_5 - 2a = 3r \rightarrow a = \frac{\mu_5 - 3r}{2} = \frac{r}{2} \quad \boxed{1}$$

$$S = -4 \quad P = a$$

$$\alpha, \beta = \frac{-4 \pm \sqrt{16 - 4a}}{2} \quad \alpha < \beta \rightarrow \alpha = -3 - \sqrt{9 - a}$$

$$\alpha^2 + r(\alpha^2 + \beta^2) = \alpha^2 + r(S^2 - 2P)$$

$$(-3 - \sqrt{9 - a})^2 + r(16 - 2a) = 12\sqrt{r} + 1\omega \rightarrow \alpha = 1$$

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$$x^r - vx^r - \omega = 0$$

$$rp^r - rSp + rS = ?$$

$$x^r = \frac{v \pm \sqrt{v^2 + 4\omega}}{2} = \frac{v \pm \sqrt{9}}{2} \xrightarrow{x^r} \frac{v + \sqrt{9}}{2} \text{ GG}$$

$$\searrow \frac{v - \sqrt{9}}{2} \text{ GG}$$

(2)

$$x = \pm \sqrt{\frac{v + \sqrt{9}}{2}} \Rightarrow S = 0$$

$$(p = \frac{v + \sqrt{9}}{2})$$

$$rp^r - rSp + rS = rp^r - r(\cdot)p + r(\cdot) = rp^r \Rightarrow -r(-\frac{v + \sqrt{9}}{2})^r$$

$$= r \sqrt{\frac{9 + 9 + 18\sqrt{9}}{4}} = \frac{11 + 18\sqrt{9}}{2} = 9 + 9\sqrt{9} \checkmark$$

$$[ab] = ?$$

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

$$yax^r + ax - y = 0$$

$$\alpha + i\omega, \beta + i\omega \Rightarrow S = (\alpha + i\omega)(\beta + i\omega) = \frac{q}{r}$$

$$\alpha, \beta \Rightarrow S = \alpha\beta = \frac{-a}{r} \cdot \frac{1}{r} \quad \left. \begin{array}{l} \alpha + \beta = \frac{a}{r} - 1 \\ \alpha\beta = \frac{q}{r} \end{array} \right\} \Rightarrow \frac{1}{r} = \frac{q}{r} - 1$$

$$\frac{1}{r} = \frac{q}{r} \Rightarrow \boxed{q-1}$$

(6) =

(2)

$$p = (\alpha + i\omega)(\beta + i\omega) = \alpha\beta + i\omega(\alpha + \beta) + i^2\omega^2 = \frac{b}{r}$$

$$p = \alpha\beta = \frac{-c}{r} = -r$$

$$\Rightarrow -r + i\omega(\frac{1}{r}) + i^2\omega^2 = \frac{b}{r}$$

$$\Rightarrow \frac{b}{r} = -r \Rightarrow \boxed{b = -r^2}$$

$$[ab] = [\frac{(1)(-1)}{r}] = [\frac{-r}{r}] = -r \checkmark$$

$$ax^r - ax - b = 0 \quad \varepsilon \cdot \beta^r + r \cdot \alpha^r - r \cdot \beta = 1V \Rightarrow r \cdot \beta^r + r \cdot \alpha^r - r \cdot \beta = 1V \quad (V \text{ دال})$$

$$\begin{cases} S=1 \\ p = -\frac{b}{a} \end{cases} \Rightarrow \begin{cases} r(\beta^r + \alpha^r) + r \cdot \beta^r - r \cdot \beta = 1V \\ S^r - rP = (1)^r - r(\frac{-b}{a}) = 1 + \frac{rb}{a} \end{cases}$$

(2)

$$ax^r - ax - b \xrightarrow{\div a} x^r - x - \frac{b}{a} \xrightarrow{x^r} r \cdot x^r - r \cdot x - \frac{r \cdot b}{a} = 0 \Rightarrow$$

$$\Rightarrow r \cdot \beta^r - r \cdot \beta = \frac{r \cdot b}{a}$$

$$r \cdot (1 + \frac{rb}{a}) + \frac{r \cdot b}{a} = 1V \Rightarrow r + r \cdot \frac{b}{a} + \frac{r \cdot b}{a} = 1V \Rightarrow \frac{r \cdot b}{a} = -r \Rightarrow \frac{b}{a} = -\frac{1}{r_0}$$

$$\hookrightarrow \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{1 - 4(-\frac{b}{a})}}{1} = \frac{\sqrt{1 - (-\frac{1}{\omega})}}{1} = \sqrt{\frac{r}{a}} = \frac{r\sqrt{\omega}}{\omega} \checkmark$$

$$x^r - (a+1)x + a = 0 \quad \alpha + r, \alpha \in \mathbb{C}$$

(1) سؤال

$$\left. \begin{aligned} S = \alpha + \alpha + r = r\alpha + r = a+1 &\Rightarrow r\alpha + 1 = a \\ P = \alpha(\alpha + r) = \alpha^r + r\alpha = a &\Rightarrow \alpha^r + r\alpha = a \end{aligned} \right\} \Rightarrow \alpha^r + r\alpha = r\alpha + 1$$

$$\alpha^r = 1 \rightarrow \alpha = \pm 1$$

$$\alpha \in \mathbb{N} \rightarrow \alpha = 1 \text{ GG}$$

$$a = r\alpha + 1 = r(1) + 1 = \boxed{r}$$

$$x^r - (r\alpha + 1)x + b = 0$$

$$x^r - (r(r) + 1)x + b = 0 \rightarrow x^r - 1 \cdot x + b = 0 \rightarrow \beta + r, \beta \in \mathbb{C}$$

$$S = \beta + (\beta + r) = r\beta + r = 1 \Rightarrow \beta = \varepsilon, \beta + r = \varepsilon + r = \varepsilon$$

$$P = r \times \varepsilon = \boxed{r\varepsilon = b} \quad \text{بالمقابل } b - a = |r\varepsilon - r| = r1 \checkmark$$

$$x^r + x - 1 - m^r = 0 \quad \alpha^r + \beta^r = ?$$

(2) سؤال

$$S^r - rP = (1)^r - r(-1 - m^r) = 1 + r + m^r = r m^r + r \quad y_s = -\frac{\Delta}{\varepsilon a} = -\frac{0 - f(r)(r)}{f(r)} = \frac{1 \times r}{1} = \boxed{r} \checkmark$$

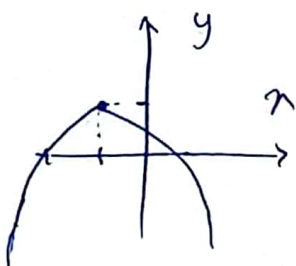
$$A(r, y) \quad B(-a, y) \quad y_s = 1 \quad \alpha^r + \beta^r = a$$

(3) سؤال

$$x_s = \frac{x_A + x_B}{r} = \frac{r + (-a)}{r} = -1 \Rightarrow r x_s = S \Rightarrow S = \boxed{-r}$$

$$S^r - rP = a \Rightarrow (-r)^r - rP = a \quad r - rP = a \quad P = -\frac{1}{r} \quad (r)$$

$$a(x^r - Sx + P) = a(x^r + rx - \frac{1}{r}) \xrightarrow{S(-1)}$$



$$\text{معادلة } a x - \frac{1}{r} = -\frac{1}{r} x - \frac{r}{r} = \boxed{\frac{1}{r}} \checkmark$$

$$\left\{ \begin{aligned} a((-1)^r + r(-1) - \frac{1}{r}) &= 1 \\ a(1 - r - \frac{1}{r}) &= 1 \Rightarrow a = \frac{-r}{r} \end{aligned} \right.$$