لیلا ابراهیمی شماره تکلیف ۲۰ یازدهم (دفتر)

(۱)

$\alpha = ۳\beta = ۴\beta = \frac{a}{۳}$

$۳\beta \times \beta = ۳\beta^۲ \qquad ۳\beta^۲ = \frac{۴}{۳} \qquad \beta^۲ = \frac{۴}{۹} \longrightarrow \beta = \pm\frac{۲}{۳}$

$۲ + \frac{۲}{۳} = \frac{a}{۳} \longrightarrow \frac{۸}{۳} = \frac{a_۱}{۳} \longrightarrow a_۱ = ۸ \qquad a_۱ - a_۲ = ۸ - (-۸) = ۱۶$

$\beta = -\frac{۲}{۳} \longrightarrow \alpha = -۲ \longrightarrow -۲ - \frac{۲}{۳} = \frac{a}{۳} \longrightarrow a_۲ = -۸$

(۲)

$\sqrt{\frac{۱}{\alpha}} + \sqrt{\frac{۱}{\beta}} = ۵ \longrightarrow \frac{۱}{\sqrt{\alpha}} + \frac{۱}{\sqrt{\beta}} = ۵ \longrightarrow \frac{\sqrt{\beta} + \sqrt{\alpha}}{\sqrt{\alpha\beta}} = ۵$

$\alpha\beta = \frac{۱}{۳۶} \qquad \alpha + \beta = \frac{m + ۱۴}{۳۶}$

$\alpha + \beta + ۲\sqrt{\frac{۱}{۳۶}} = \frac{۲۵}{۳۶} \Longrightarrow \frac{m + ۱۴}{۳۶} = \frac{۲۵}{۳۶} - \frac{۱۲}{۳۶} = \frac{۱۳}{۳۶}$

$m + ۱۴ - ۱۳ = m = -۱$

$mx^۲ + ۳x + ۲ = ۰$

$-x^۲ + ۳x + ۲ = ۰ \qquad \frac{c}{a} = -۲$

(۳)

$(\alpha + \beta)^۲ = ۱ \longrightarrow \alpha^۲ + \beta^۲ + \underbrace{۲\alpha\beta}_{-۴} = ۱ \longrightarrow \alpha^۲ + \beta^۲ = ۵$

$\left.\begin{array}{l} \alpha^۲ + \beta^۲ = ۵ \\ \alpha + \beta = ۱ \end{array}\right\} \begin{array}{l} \alpha = ۲ \\ \beta = -۱ \end{array}$

$۴ \times (-۱)^۳ + k + ۹ - ۲ = ۰ \longrightarrow \boxed{k = -۳}$ ✓

$۴ \times ۸ + ۴k - ۱۸ - ۲ = ۰ \longrightarrow \boxed{k = -۳}$ ✓

۴

$$3a^2 + 2a^2 = 2.5\alpha^2 + 2.5\beta^2 + 0.5\alpha^2 - 0.5\beta^2$$

$$\frac{5}{2}(\alpha^2+\beta^2) + \frac{1}{2}(\alpha^2+\beta^2)$$

$$\alpha^2+\beta^2 = S^2 - 2P = 36 - 2a$$

$$\alpha^2-\beta^2 = (\alpha+\beta)(\alpha-\beta) = -6(\sqrt{36-4a})$$

$$= 6\sqrt{36-4a}$$

$$\frac{5}{2}(\alpha^2+\beta^2) + \frac{1}{2}(\alpha^2-\beta^2) \longrightarrow 90 - 5a + 3\sqrt{36-4a} = 12\sqrt{2} + 85$$

$$90 - 5a = 85 \longrightarrow a = 1 \qquad 3\sqrt{36-4a} = 12\sqrt{2} \longrightarrow \boxed{a=1}$$

۵

$$x^2 = t \qquad t = \frac{+7 \pm \sqrt{69}}{2}$$

$$t^2 - 7t - 5 = 0 \qquad x = \pm\sqrt{\frac{7+\sqrt{69}}{2}} \qquad S = 0 \to P = \frac{-7-\sqrt{69}}{2}$$

$$\Delta = 49 + 20 = 69$$

$$2P^2 - 3PS + 2S = 0 \Rightarrow 2P^2 = \frac{49+69+14\sqrt{69}}{4} \times 2 = \boxed{59 + 7\sqrt{69}}$$

۶

$$\alpha+\beta = -\frac{1}{2} \qquad \alpha+\beta = -\frac{1}{2} \qquad \alpha + \frac{1}{2} + \beta + \frac{1}{2} = \frac{a}{2}$$

$$\alpha+\beta = \frac{a-2}{2} \longrightarrow a = 1 \qquad \alpha\beta = -\frac{3}{a} \qquad \alpha+\beta+1 = \frac{a}{2}$$

$$\left(\frac{1}{2}+\alpha\right)\left(\frac{1}{2}+\beta\right) = \frac{1}{4} + (\alpha+\beta)\frac{1}{2} + \alpha\beta = \frac{b}{2}$$

$$\frac{1}{4} - \frac{1}{4} - \frac{12}{4} = \frac{b}{2} \longrightarrow b = -6 \qquad \left[\frac{ab}{4}\right] = \left[\frac{1 \times -6}{4}\right] = \left[-\frac{3}{2}\right] = -2$$

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$$a\alpha^2 - a\alpha - b = 0 \qquad S = 1$$

$$a\beta^2 - a\beta - b = 0 \longrightarrow \beta^2 - \beta = \frac{b}{a} \qquad P = -\frac{b}{a} \qquad 40\beta^2 + 20\alpha^2 - 20\beta = 20\beta^2 + 20\alpha^2 + 20\beta^2 - 20\beta$$

$$20(S^2 - 2P) + 20(\beta^2 - \beta) \Rightarrow 20\left(1 + \frac{2b}{a}\right) + 20\left(\frac{b}{a}\right) = 20 + 40\frac{b}{a} + 20\frac{b}{a} = 20 + 60\frac{b}{a} = 17$$

$$\frac{b}{a} = -\frac{1}{20} \longrightarrow b = -\frac{1}{20}a \Rightarrow \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{a^2 + 4ab}}{|a|} = \frac{\sqrt{a^2 - \frac{a^2}{5}}}{|a|} = \frac{|a|\sqrt{\frac{4}{5}}}{\cancel{|a|}}$$

$$\sqrt{\frac{4}{5}} = \boxed{\frac{2}{\sqrt{5}}}$$

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$a = 2k+1 \times 2k-1 = 4k^2 - 1$

$a+1 = 4k \to a = 4k-1$

$$\begin{cases} 4k^2 - 4k = 0 \\ 4k(k-1) = 0 \to k=1 \\ \qquad\qquad\quad k=0 \end{cases}$$

$\boxed{a = 3}$

$b = 4k'^2 + 4k'$

$3a+1 = 4k'+2$

$10 = 4'k+2 \to k' = 2 \to b = 24$

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

9

$\alpha+\beta = -1$

$\alpha\beta = -1-m^2$

$m^2 = 0$

$\alpha^2+\beta^2 = S^2 - 2P = 1 - 2(-m^2-1) = 3+2m^2$

$3+2m^2 \xrightarrow{m=0} 3$

10

$S | -1$

$y = a(x+1)^2+1 \to 0 = a(x^2+1+2x)+1$

$\to 0 = ax^2 + a + 2ax + 1$

$\alpha+\beta = \frac{-2a}{a} = -2 \qquad \alpha\beta = \frac{a+1}{a}$

$\alpha^2+\beta^2+2\alpha\beta = 4 \to 2\alpha\beta = -1$

$\alpha\beta = -\frac{1}{2}$

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

$y = -\frac{2}{3}+1$

$x=0 \to \boxed{y = \frac{1}{3}}$