یازدهم تجربی — فاطمه ملکیت - ۱۹

Date — No

1- $3x^2 - ax + 4 = 0$

ریشه‌ها α, β $\quad \alpha = 3\beta \Rightarrow S = 4\beta \to 4\beta = \frac{a}{3} \Rightarrow \beta = \frac{a}{12}$

$P = 3\beta^2 \to 3\beta^2 = \frac{4}{3} \Rightarrow \beta^2 = \frac{4}{9} \Rightarrow \beta = \pm\frac{2}{3}$

$\beta = \frac{2}{3} = \frac{a}{12} \Rightarrow a = 8$

$\beta = -\frac{2}{3} = \frac{a}{12} \Rightarrow a = -8$

$\to |a_1 - a_2| = \boxed{16}$

2- $36x^2 - (m+14)x + 1 = 0$ $\qquad mx^2 + 3x + 2 = 0$

ریشه‌ها α, β $\quad \frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = 5$ $\qquad S = \frac{3}{m} = \boxed{-3}$

$\frac{\sqrt{\beta}+\sqrt{\alpha}}{\sqrt{\alpha\beta}} = 5 \to \sqrt{\beta} + \sqrt{\alpha} = 5\sqrt{\alpha\beta}$

$\longrightarrow \alpha + \beta + 2\sqrt{\alpha\beta} = 25\alpha\beta$

$\alpha + \beta = \frac{m+14}{36}$

$\alpha\beta = \frac{1}{36}$ $\quad \frac{m+14}{36} + \frac{12}{36} = \frac{25}{36} \longrightarrow \frac{m+1}{36} = 0 \Rightarrow m = -1$

3- $4x^3 + kx^2 - 9x - 2 = 0$ $\qquad \alpha + \beta = 1 \qquad \alpha\beta = -2$

$\alpha = 1 - \beta$

$\Rightarrow (1-\beta)(\beta) = -2 \Rightarrow \beta^2 - \beta - 2 = 0 \to \beta = 2 \Rightarrow \alpha = -1, \quad \beta = -1$

$\qquad \to \beta = -1 \qquad \beta = 2 \qquad \alpha = 2$

$\xrightarrow{x=-1} -4 + k + 9 - 2 = 0 \Rightarrow \boxed{k = -3}$

4- $x^2 + 6x + a = 0$ $\qquad \alpha < \beta < 0$ $\qquad 3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 85$

5- $x^4 - 7x^2 - 5 = 0$ $\qquad 2P^2 - 3SP + 2S$

$x^2 = t$

$t^2 - 7t - 5 = 0$

ریشه‌ها $= a, b \Rightarrow x^2 = a \Rightarrow x = \pm\sqrt{a}$

$x^2 = b \Rightarrow x = \pm\sqrt{b}$

$\Rightarrow S = 0$

$P = ab = -5$

$\Rightarrow 2 \times 25 - 0 + 0 = \boxed{50}$

6- $2x^2 - ax + b = 0$ $\quad 2ax^2 + ax - 6 = 0$ $\quad \left[\frac{ab}{4}\right]$

$\{\alpha, \beta \quad\quad \alpha', \beta'$

$\left.\begin{array}{l} \alpha = \alpha' + \frac{1}{2} \\ \beta = \beta' + \frac{1}{2} \end{array}\right\} \Rightarrow \alpha + \beta = \alpha' + \beta' + 1$

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

$\Rightarrow \boxed{\left[\frac{-6}{4}\right] = -2}$

$\alpha\beta = \alpha'\beta' + \frac{1}{4} + \frac{1}{2}(\alpha' + \beta')$

$\frac{b}{2} = -3 + \frac{1}{4} + \frac{1}{2} \times -\frac{1}{2} \Rightarrow b = -6$

7- $20(2\alpha\beta^2 + \alpha^3 + \beta) = 17$ $\quad \beta(2\beta - 1) + \alpha^2 = \frac{17}{20}$

$\beta(2\beta - \alpha - \beta) + \alpha^2 = \frac{17}{20}$

$\beta(\beta - \alpha) + \alpha^2 = \frac{17}{20}$ $\quad (1)$

$\beta^2 + \alpha^2 - \alpha\beta = \frac{17}{20} \rightarrow \alpha^2 + \beta^2 - 2\alpha\beta = \frac{17}{20} - \alpha\beta$

$1 + \frac{2b}{a} + \frac{b}{a} = \frac{17}{20}$

$|\alpha - \beta| = \_\_\_$ $\quad \Rightarrow \frac{3b}{a} = -\frac{3}{20} \Rightarrow \frac{b}{a} = -\frac{1}{20} \Rightarrow \alpha\beta = \frac{1}{20}$

$(1) \rightarrow \alpha^2 + \beta^2 - 2\alpha\beta = (\alpha - \beta)^2 = \frac{16}{20} \Rightarrow \alpha - \beta = \frac{4}{\sqrt{20}}$

8- $x^2 - (a+1)x + a = 0 \rightarrow S = a + 1$, $P = a$ $\Rightarrow$ [illegible] $\rightarrow 2$, [illegible] $\rightarrow a = 3$ $\quad \} P = 3$

$x^2 - 10x + b = 0 \rightarrow 2\alpha, 2\alpha + 2$

$S = 10 = 4\alpha + 2 = 10 \Rightarrow \alpha = 2 \rightarrow 4 - 20 + b = 0 \Rightarrow b = 16$ $\quad \} P = 16$

$P = b$

$\boxed{16 - 3 = 13}$

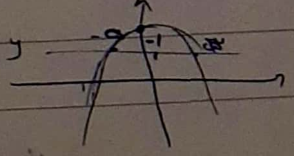
9- $(\alpha + \beta)^2 = 1 = \underbrace{\alpha^2 + \beta^2}_{1 - 2\alpha\beta} + 2\alpha\beta$

$\Rightarrow \alpha^2 + \beta^2 = 1 - 2\alpha\beta \rightarrow \alpha^2 + \beta^2 = 1 + 2 + 2m^2 = 2m^2 + 3$ max

$\boxed{y_{min} = 3}$

$x_{min} = 0$

10- $A\begin{vmatrix} c \\ y \end{vmatrix}$ $B\begin{vmatrix} -a \\ y \end{vmatrix}$



$\left.\begin{array}{l} x_s = -1 \\ y_s = 1 \end{array}\right\} \rightarrow \frac{-b}{2a} = -1 \Rightarrow -\frac{b}{a} = 2 \Rightarrow \alpha + \beta$