نام و نام خانوادگی: آیلین عظیمی — تکلیف: ۱۹ — کلاس: دهم تجربی

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

$\alpha , 3\alpha \to S = \frac{-b}{a} = 4\alpha \to \frac{a}{3} = 4\alpha \to 12\alpha = a \to \alpha = \frac{a}{12}$ — (۱۶) : اصلاح — ۱

$\to P = \frac{c}{a} = 3\alpha^2 \to \frac{4}{3} = 3\alpha^2 \to \alpha^2 = \frac{4}{9}$

$\alpha = \frac{2}{3} = \frac{a}{12} \to a = 8$

$\alpha = -\frac{2}{3} = \frac{a}{12} \to a = -8$

$36x^2 - (m+14)x + 1 = 0$ — $mx^2 + 3x + 2 \to \frac{c}{a} = \frac{2}{m} \to \frac{2}{m} = -2 = \frac{c}{a}$

$\sqrt{\frac{1}{\alpha}} + \sqrt{\frac{1}{\beta}} = 5$ — $S = \frac{m+14}{36}$ — $P = \frac{1}{36}$ — ۲

توان ۲ $\frac{1}{\alpha} + \frac{1}{\beta} + 2\sqrt{\frac{1}{\alpha\beta}} = 25 \to \frac{\alpha+\beta}{\alpha\beta} + 2\sqrt{\frac{1}{\alpha\beta}} = 25 \Rightarrow 36(\alpha+\beta) + 12 = 25$

$36(\alpha+\beta) = 13$

$\alpha+\beta = \frac{13}{36} = \frac{m+14}{36} \to m = -1$

$4x^3 + kx^2 - 9x - 2 = 0$

$\alpha+\beta = 1 \to \beta = 1-\alpha$

$\alpha\beta = -2 \to \alpha(1-\alpha) = -2$

$\alpha - \alpha^2 = -2$

$\alpha^2 - \alpha - 2 = 0$ — ۳

$(\alpha-2)(\alpha+1) = 0$

$\alpha = 2 \to 32 + 4k - 18 - 2 = 0 \to 4k = -12 \to k = -3$

$\alpha = -1 \to -4 + k + 9 - 2 = 0 \to \boxed{k = -3}$

$x^2 + 6x + a = 0 \to \alpha+\beta = \frac{-b}{a} = -6 \to \alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta = 36 - 2a$

$\alpha\beta = a$, $a > 0$, $\alpha < \beta < 0$

$\to \alpha^2 - \beta^2 = (\alpha+\beta)(\alpha-\beta) = -6(\sqrt{36-4a}) = -12\sqrt{9-a}$

$3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 85 \to 2.5\alpha^2 + 0.5\alpha^2 + 2.5\beta^2 - 0.5\beta^2 = 12\sqrt{2} + 85$ — ۴

$\frac{5}{2}\underbrace{(\alpha^2+\beta^2)}_{36-2a} + \frac{1}{2}\underbrace{(\alpha^2-\beta^2)}_{-12\sqrt{9-a}} = 90 - 5a - 6\sqrt{9-a} = 12\sqrt{2} + 85$

$6\sqrt{9-a} = 90 - 5a - 12\sqrt{2} - 85 = 5 - 12\sqrt{2} - 5a$

توان ۲ $36(9-a) = 25 + 288 - 120\sqrt{2} + 25a^2 - 10a(5 - 12\sqrt{2})$

$25a^2 - 14a - 11 = 0 \leftarrow 324 - 36a = 313 - 120\sqrt{2} + 25a^2 - 50a + 120\sqrt{2}a$

$a = 1$ یا $a = -\frac{11}{25}$

$x^4 - 7x^2 - 5 = 0 \xrightarrow{x^2 = t} t^2 - 7t - 5 \to$ جمع $= 7$ ، ضرب $= -5$ $\to$ پس دو t مختلف العلامت — چون به عدد مثبت نیاز داریم

$t = \frac{7+\sqrt{69}}{2} = x^2$ — $t = \frac{7-\sqrt{69}}{2}$ غ ق ق — ۵

$2P^2 - 3SP + 2S = ?$

$x = \sqrt{\frac{7+\sqrt{69}}{2}}$ — $x = -\sqrt{\frac{7+\sqrt{69}}{2}}$ $\to$ پس $S = 0$ وقتی صفر است فقط $2P^2$ را بدست آوریم:

$P = -\frac{7+\sqrt{69}}{2} \to 2P^2 = 2\frac{(7+\sqrt{69})^2}{4} = \frac{118 + 14\sqrt{69}}{2} = 59 + 7\sqrt{69}$

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

$\alpha \quad \beta$

$\alpha\beta = \frac{b}{2}$

$\alpha+\beta = \frac{a}{2}$

$2ax^2 + ax - 6 = 0$

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

$\to S: \alpha+\beta-1 = \frac{a}{2}-1 = \frac{-b}{a} \to \frac{a}{2}-1 = \frac{-a}{2a} = -\frac{1}{2} = \frac{a}{2}-1$ $\qquad \frac{a}{2} = +\frac{1}{2}$ $\qquad \underline{a=1}$ 6

$\to P: \underbrace{\alpha\beta}_{\frac{b}{2}} - \frac{1}{2}(\overbrace{\alpha+\beta}^{\frac{a}{2}}) + \frac{1}{4} = \frac{c}{a} \to \frac{b}{2}\cancel{\left(-\frac{1}{4}\right)} + \cancel{\frac{1}{4}} = \overbrace{\left(\frac{-6}{2a}\right)}^{-3}$

$\frac{b}{2} = -3 \to \underline{b = -6}$

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

$ax^2 - ax - b = 0$

α, β

$\alpha+\beta = 1 \to \alpha = 1-\beta$

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

$\beta - \beta^2 = -\frac{b}{a}$

$\beta^2 - \beta = \frac{b}{a}$

$40\beta^2 + 20\alpha^2 - 20\beta = 17$

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

$20\underbrace{(\alpha^2+\beta^2)}_{(\alpha+\beta)^2 + \frac{2b}{a} \to -2\alpha\beta} + 20\underbrace{(\beta^2-\beta)}_{\frac{b}{a}} = 17$

$1 + \frac{2b}{a}$

$20\left(1+\frac{2b}{a}\right) + \frac{20b}{a} = 17$

$20 + \frac{40b}{a} + \frac{20b}{a} = 17$

$\frac{60b}{a} = -3 \to \underline{a = -20b}$

اختلاف ریشه‌ها $\longrightarrow \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{a^2+4ab}}{a} = \frac{\sqrt{400b^2 - 80b^2}}{-20b} = \frac{\sqrt{320b^2}}{-20b}$

$= \left|\frac{8\sqrt{5}\,b}{-20b}\right| = \boxed{\frac{2}{\sqrt{5}}}$ 7

$x^2 - (a+1)x + a = 0 \longrightarrow$ ریشه‌ها: $\alpha: 2k+1$, $\beta: 2k+3$ $\to S: a+1 = 4k+4 \to a = 4k+3$; $P: a = 4k^2+8k+3$

$4k+3 = 4k^2+8k+3$

$4k^2+4k=0$

$4k(k+1)=0$

$k=-1$ غ‌ق‌ق

$\leftarrow \boxed{k=0}$

ریشه‌ها

منفی ۵ درصد

$P = 3$ $\left\{ \begin{array}{l} 1=\alpha \\ 3=\beta \end{array} \right.$

$\underline{a=3}$

$x^2 - (3a+1)x + b = 0$

$\alpha': 2t$ $\quad \beta': 2t+2$ $\to S: 3a+1 = 4t+2$; $P: b = 4t^2+4t$ 8

$\xrightarrow{a=3} 10 = 4t+2 \to 4t = 8$, $t=2 \to \alpha'=4$, $\beta'=6$, $P' = 24 = b$

اختلاف ضرب ریشه‌ها: $P-P' = 24-3 = 21$

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

α, β

$\alpha^2+\beta^2 = (\overset{1}{\alpha+\beta})^2 - 2\overset{-1-m^2}{\alpha\beta} = 1 + 2 + 2m^2$

$\alpha^2+\beta^2 = \underbrace{2m^2+3}$

سوال در واقع کمترین مقدار این عبارت را می‌خواهد

$2m^2+3$

$x_{min} \to \frac{-b}{2a} = \begin{bmatrix}0\\3\end{bmatrix} \longrightarrow$ کمترین مقدار $= \boxed{3}$ 9

$A: \begin{bmatrix}3\\6\end{bmatrix} \quad B\begin{bmatrix}-5\\6\end{bmatrix}$

عرض رأس $= 1$

ریشه‌ها α و β

$\alpha^2+\beta^2 = 5$

$y = ax^2+bx+c$

A نقطه $\to 9a+3b+\cancel{c} = 6$

$B \to 25a-5b-\cancel{c} = 6$

$-16a+8b=0$

$16a = 8b$

$2a = b \to y = ax^2+2ax+c$

از طرفی

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

$\alpha\beta = \frac{c}{a}$

$\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta$

$5 = 4 - \frac{2c}{a}$

$\frac{2c}{a} = -1$

$-a = 2c$

$c = -\frac{a}{2}$ 10

$\boxed{y = ax^2+2ax-\frac{a}{2}}$

از طرفی

عرض رأس $= \frac{-\Delta}{4a} = 1 \to \frac{-(4a^2+2a^2)}{4a} = 1$

$-\frac{3}{2}a = 1 \to a = \frac{-2}{3}$

عرض از مبدأ: $c = -\frac{a}{2} = -\frac{1}{2}\left(\frac{-2}{3}\right) = \frac{1}{3}$