Year: Month: Day: | | Subject: ۱۸٫۵

★ صبا رجبی، تالیف ۱۹، یازدهم تجربی A ★

۱) $3x^2 - ax + 4 = 0 \longrightarrow$ ریشه‌ها: $\alpha , 3\alpha \rightarrow P = 3\alpha^2 = \frac{4}{3} \Rightarrow \alpha = \pm \frac{2}{3}$

$(1): \alpha = \frac{2}{3} \rightarrow 3\left(\frac{4}{9}\right) - \frac{2a}{3} + 4 = 0 \rightarrow a_1 = 8$

$(2): \alpha = -\frac{2}{3} \rightarrow 3\left(\frac{4}{9}\right) + \frac{2a}{3} + 4 = 0 \rightarrow a_2 = -8$

$\rightarrow \boxed{a_1 - a_2 = 16}$

۲) $36x^2 - (m+14)x + 1 = 0 \qquad \frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = 5$

$(\sqrt{\alpha} + \sqrt{\beta})^2 = \underbrace{\alpha + \beta}_{S} + 2\underbrace{\sqrt{\alpha\beta}}_{P} = \frac{m+14}{36} + \frac{2}{6} = \frac{m+26}{36} \Rightarrow \boxed{\sqrt{\alpha} + \sqrt{\beta} = \frac{\sqrt{m+26}}{6}}$

$\frac{1}{\sqrt{\alpha}} + \frac{1}{\sqrt{\beta}} = \frac{\sqrt{\alpha} + \sqrt{\beta}}{\sqrt{\alpha\beta}} = \frac{\frac{\sqrt{m+26}}{6}}{\frac{1}{6}} = \sqrt{m+26} = 5 \rightarrow m + 26 = 25$

$\Rightarrow \boxed{m = -1}$

$\rightarrow \cancel{m}^{-1}x^2 + 3x + 2 = 0 \rightarrow$ حاصلضرب ریشه‌ها $P = \boxed{\frac{2}{-1}}$

۳) $S = 1 , P = \alpha\beta = -2 \rightarrow \alpha , \frac{-2}{\alpha} \rightarrow \alpha - \frac{2}{\alpha} = \frac{\alpha^2 - 2}{\alpha} = 1$

$\rightarrow \alpha^2 - 2 - \alpha = 0 \rightarrow (\alpha - 2)(\alpha + 1) \rightarrow$ ریشه‌ها: $2 , -1$

$x = -1 \rightarrow -4 + K + 9 - 2 = 0 \rightarrow \boxed{K = -3}$

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$x^2+6x+a=0 \rightarrow 3\alpha^2+2\beta^2=\frac{5}{2}\alpha^2+\frac{\alpha^2}{2}+\frac{5}{2}\beta^2-\frac{\beta^2}{2}=$ (۴

$\frac{5}{2}(\alpha^2+\beta^2)+\alpha^2-\beta^2=\frac{5}{2}(S^2-2P)+\frac{1}{2}S\left(\frac{\sqrt{\Delta}}{|a|}\right)=$

$\frac{5}{2}(36-2a)-6\sqrt{9-a}=90-5a+6\sqrt{9-a}=12\sqrt{2}+85$

$\cancel{90-85}^{\,5}-12\sqrt{2}-5a=6\sqrt{9-a}$ (۵

$-50a+120a\sqrt{2}+25+\underbrace{288}_{313}+25a^2-120\sqrt{2}=36(9-a)$

$\rightarrow 25a^2-120\sqrt{2}+(120\sqrt{2}-50)a=11-36a \rightarrow \boxed{a=1}$

$ax^2-ax-b=0 \rightarrow S=1 \rightarrow \alpha+\beta=1 \rightarrow \beta=1-\alpha$ (۷

شرط: $40(1-\alpha)^2+20\alpha^2-20(1-\alpha)=17$

$40(1-2\alpha+\alpha^2)+20\alpha^2-20+20\alpha=17$ (۵

$40-80\alpha+40\alpha^2+20\alpha^2-20+20\alpha=17 \rightarrow 60\alpha^2-60\alpha+20=17$

$\rightarrow 60\alpha^2-60\alpha+3=0 \xrightarrow{\div 3} 20\alpha^2-20\alpha+1=0$

چون α ریشه معادله است: $20x^2-20x+1=0$

$|\alpha-\beta|=\frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{400-80}}{20}=\frac{8\sqrt{5}}{20}=\boxed{\frac{2\sqrt{5}}{5}}$

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$x^4 - 7x^2 - 5 = 0 \xrightarrow{x^2 = t} t^2 - 7t - 5 = 0$ (۵

$\Delta = 49 - (4 \times 1 \times -5) = 49 + 20 = 69$

$\rightarrow t = \frac{7 \pm \sqrt{69}}{2} \rightarrow x^2 = \frac{7 + \sqrt{69}}{2}$ ۵

$\rightarrow x = \pm\sqrt{\frac{7+\sqrt{69}}{2}} \rightarrow S = 0$

$\rightarrow P = \frac{-(7+\sqrt{69})}{2}$

$2P^2 - 3\cancel{S}P + 2\cancel{S} = 2P^2 = 2\left(\frac{49 + 69 + 14\sqrt{69}}{4}\right) = \frac{118 + 14\sqrt{69}}{2}$

$= \boxed{59 + 7\sqrt{69}}$

$2x^2 - ax + b = 0 \rightarrow S_1 = a/2 \quad P_1 = b/2 \rightarrow \alpha + \beta = a/2$ (۶

$2ax^2 + ax - 6 = 0 \rightarrow S_2 = -1/2 \quad P_2 = -\frac{3}{a} \rightarrow \alpha + \beta + 1 = -1/2$

$\rightarrow S_1 + 1 = S_2 \rightarrow a/2 + 1 = -1/2 \rightarrow \boxed{a = -3}$ ۰٫۵

$2x^2 + 3x + b = 0$

$-6x^2 - 3x - 6 = 0 \rightarrow P = (\alpha + 1/2)(\beta + 1/2) = \alpha\beta + \frac{\alpha+\beta}{2} + 1/4$

$= \frac{b}{2} - \frac{3}{4} + \frac{1}{4} = 1 \Rightarrow \boxed{b = 3} \Rightarrow \left[\frac{\overset{-9}{ab}}{4}\right] = -3$

$2x^2 - ax + b = 0 \begin{cases} S = \frac{a}{2} \\ P = \frac{b}{2} \end{cases}$ $\quad 2ax^2 + ax - 6 \begin{cases} S = \frac{-1}{2} \rightarrow \alpha + \beta = \frac{1}{2} = \frac{a}{2} \rightarrow a = 1 \\ P = -3 \rightarrow b = -6 \end{cases}$ (۶

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

۶)

$x^2+x-1-m^2=0 \to S=-1$

$\to P=-(1+m^2)$ $\to \alpha^2+\beta^2=S^2-2P=1+2+2m^2$ ۲

کمترین مقدار: $m=0 \Leftarrow \boxed{S^2-2P=3}$

۸)

$x^2-(a+1)x+a=0 \to \alpha, \alpha+2 \Rightarrow S=a+1=2\alpha+2$

$\to P=a=2\alpha+\alpha^2 \Rightarrow 2\alpha+\alpha^2+1=2\alpha+2$

$\boxed{a=3} \Leftarrow \alpha=1 \to \alpha^2=1 \to \boxed{\alpha=-1}$

طبعی می شود ✗

$x^2-10x+b=0 \to \beta, \beta+2$

$\to P=b=2\beta+\beta^2,\ S=10=\underbrace{2\beta+2}$

$\boxed{\beta=4 \Rightarrow b=24}$

$b-a=24-3=\boxed{21}$

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$A(3,y)\ B(-5,y) \rightarrow \frac{-b}{2a} = x_s = \frac{3-5}{2} = -1$ رأس $y_s = 1$ (10.

$(-1,1) \rightarrow y = a(x+1)^2 + 1 = ax^2 + 2ax + a + 1$ ★

$\Delta = \sqrt{-4a} \Rightarrow \alpha = \frac{-2a \pm \sqrt{-4a}}{2a} = \begin{cases} -1-\sqrt{-1/a} \\ -1+\sqrt{-1/a} \end{cases} \longrightarrow P = ?$ $S = -2$

$\alpha^2 + \beta^2 = S^2 - 2P = 4 - 2(1 - 1/a) = 5 \rightarrow -2/a = 3$

$\rightarrow a = -2/3$

★ $\rightarrow y = -2/3(x+1)^2 + 1 \xrightarrow{x=0} \boxed{y = 1/3}$