رومی زاده

19,75

1 (2)

$\alpha = 3\beta$

$\alpha\beta = 3\beta^2 = \frac{4}{3} \to \beta = \pm\frac{2}{3}$
$\begin{cases} \alpha = 2 \quad \beta = \frac{2}{3} \to \frac{8}{3} = \frac{a}{3} \to a = 8 \\ \alpha = -2 \quad \beta = -\frac{2}{3} \to -\frac{8}{3} = \frac{a}{3} \to a = -8 \end{cases}$

$8 - (-8) = \boxed{16}$ ✓

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2 (2)

$\sqrt{\frac{1}{\alpha}} + \sqrt{\frac{1}{\beta}} = 5 \to \frac{1}{\alpha} + \frac{1}{\beta} + 2\sqrt{\frac{1}{\alpha\beta}} = 25 \to \frac{m+14}{36} \times 36 + 2 \times 6 = 25$

$\alpha\beta = \frac{1}{36}$

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

$\to m + 14 = 13 \Rightarrow \boxed{m = -1}$

$P' = \frac{2}{m} = \boxed{-2}$ ✓

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3 (2)

$\alpha\beta = -2 \;,\; \alpha + \beta = 1 \to \{\beta, \alpha\} = \{-1, 2\}$

$\xrightarrow{x=2} 2 \times 8 + k \times 4 - 9 \times 2 - 2 = 0 \to 20 = 4k + 32 \to \boxed{k = -3}$ ✓

$\alpha + \beta = 1 \to \beta = 1 - \alpha \to \alpha(1-\alpha) = -2 \to \alpha^2 - \alpha - 2 = 0 \begin{cases} \alpha = -1 \\ \alpha = +2 \end{cases}$

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4 (2)

~~$x^2 = t \quad t^2 - 7t - 5 = 0 \to$ منفی هم ریشه ای از جواب ها می دهد $\to S = -x_1 + x_1 + x_2 - x_2 + \dots = 0 \quad P =$~~

~~$t = \frac{7 + \sqrt{49 + 20}}{2}$~~

~~$\frac{7+\sqrt{69}}{2} = x^2 \to x = \pm\frac{7+\sqrt{69}}{2} \to P = \frac{49 + 69 + 14\sqrt{69}}{4} = \frac{59 + 7\sqrt{69}}{2}$~~

$x^2 + 6x + a = 0 \begin{cases} \alpha = \frac{-6 - 2\sqrt{9-a}}{2} = -3 - \sqrt{9-a} \to \alpha^2 = 9 + 9 - a + 6\sqrt{9-a} \to 3\alpha^2 = 54 - 3a + 18\sqrt{9-a} \;(1) \\ \beta = \frac{-6 + 2\sqrt{9-a}}{2} = -3 + \sqrt{9-a} \to 2\beta^2 = 36 - 2a - 12\sqrt{9-a} \;(2) \end{cases}$

$\beta^2 = 9 + 9 - a - 6\sqrt{9-a}$

$(1),(2) \to 3\alpha^2 + 2\beta^2 = 90 - 5a + 6\sqrt{9-a}$

$\to 90 - 5a = 85$

$9 - a = 8 \to \boxed{a = 1}$ ✓

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5 (2)

هر عددی که جواب را صفر کند منفی آن هم آن را صفر می کند $\to S = 0$

~~$x^2 = t$~~

~~$x_1 = \pm\sqrt{t_1} \quad t^2 - 7t - 5 = 0 \to S = 7, P = -5$~~

$S_t = t_1 + S_2 = -x_1 + x_1 - x_2 + x_2 = 0$

~~$P_t = t_1 t_2 \Rightarrow P_x = (\sqrt{t_1})(-\sqrt{t_1})(\sqrt{t_2})(-\sqrt{t_2}) = t_1 . t_2 = -5$~~

$x^2 = t \quad t^2 - 7t - 5 = 0 \begin{cases} x^2 = \frac{7 + \sqrt{69}}{2} \text{ ق ق} \\ x^2 = \frac{7 - \sqrt{69}}{2} \text{ غ ق ق} \end{cases} \to P = -\left(\frac{7+\sqrt{69}}{2}\right), \; S = 0$

$2P^2 - 3SP + 2S = 2P^2 = 2\left(-\frac{7+\sqrt{69}}{2}\right)^2 = 59 + 7\sqrt{69}$ ✓

$\alpha'+\beta'=\frac{a}{2}$ $\alpha'\beta'=\frac{b}{2}$ $\left.\begin{matrix}\alpha+1.5=\alpha' \\ \beta+0.5=\beta'\end{matrix}\right\} \to \alpha+\beta+2=\frac{a}{2} \to \boxed{a=2}$

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

$\alpha\beta=-\frac{3}{a}$ $(\alpha+\beta)=-\frac{a}{2}$

$\frac{b}{2}=(\alpha+1.5)(\beta+0.5)=-\frac{3}{2}+\frac{1}{4}+\frac{1}{2}(-1) \Rightarrow -\frac{7}{4}=\frac{b}{2} \to \boxed{b=-3.5}$

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$[\text{illegible}]=\left[\frac{-7}{4}\right]=-2$ ✓

$ax^2-ax-b=0 \longrightarrow x^2-x-\frac{b}{a}=0 \longrightarrow \beta^2-\beta=\frac{b}{a}$

$2\beta^2+\alpha^2-\beta=\beta^2-\beta+\alpha^2+\beta^2=\frac{17}{20} \longrightarrow \frac{b}{a}+1+2\frac{b}{a}=1+\frac{3b}{a}=\frac{17}{20} \longrightarrow \frac{b}{a}=-\frac{1}{20}$

(2) 7

$x^2-x+\frac{1}{20}=0 \longrightarrow |\alpha-\beta|=\frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{1-\frac{1}{5}}}{1}=\frac{2\sqrt{5}}{5}$ ✓

$\alpha=\beta+2$ $\alpha+\beta=2\beta+2=a+1$ $\alpha\beta=a$

$2=|\alpha-\beta|=\frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{a^2+2a+1-4a}}{1}=\sqrt{(a-1)^2} \to \begin{matrix}2=a-1 \to \boxed{a=3} \to \beta=1,\ \alpha=3 \\ 2=1-a \to a=-1 \to \text{غ ق ق} \ (\beta=0)\end{matrix}$

$\cancel{9a^2+6a+1=4b}$

$\boxed{a-b=?}$ (2) 8

$x^2-10x+b=0 \Big\} \to \boxed{b=24}$ $|24-3|=21$ ✓

$\left.\begin{matrix}\alpha'+\beta'=10 \\ \alpha'=\beta'+2\end{matrix}\right\} \to \begin{matrix}\alpha'=4 \\ \beta'=6\end{matrix}$

$\alpha^2+\beta^2=S^2-2P=1-2(-(1+m^2))=1+2+2m^2 \xrightarrow[\min]{m=0} =1+2=3$ ✓

(2) 9

$x_S=-\frac{5+3}{2}=-1 \longrightarrow y=a(x+1)^2+1=ax^2+2ax+a+1 \begin{matrix}S=-2 \\ P=\frac{a+1}{a}\end{matrix}$ 1,75

عرض از مبدا →

$\alpha^2+\beta^2=S^2-2P=5$ 10

$\longrightarrow 4-2\left(\frac{a+1}{a}\right)=5 \longrightarrow \frac{-2}{a}=3 \longrightarrow \boxed{a=-\frac{2}{3}}$ ✓ $\longrightarrow y=-\frac{2}{3}x^2-\frac{4}{3}x\boxed{+\frac{1}{3}}$

$\underbrace{}_{-2-\frac{2}{a}}$

$\boxed{\frac{a+1}{a}=-\cancel{\frac{1}{2}}}$ عرض از مبدا: