ساینا حاوری

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(1) $3x^2 - ax + 4 = 0$ مقدار a که x ، ۳ برابر ریشه دیگر اختلاف $a_2 - a_1$

α, β

$$\begin{cases} \alpha = 3\beta \quad \alpha+\beta = \\ \alpha\beta = \frac{4}{3} \\ S = \alpha+\beta = \frac{a}{3} \end{cases} \longrightarrow 4\beta = \frac{a}{3} \Rightarrow \beta = \frac{a}{12}$$

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$$\frac{a}{12} = \pm\frac{2}{3} \Rightarrow a = \pm 8 \longrightarrow |8-(-8)| = 16$$

(2) $36x^2 - (m+14)x + 1 = 0 \longrightarrow \sqrt{\frac{1}{x_1}} + \sqrt{\frac{1}{x_2}} = \omega$ مجموع جذر معکوس $= \omega$

$mx^2 + 3x + 2 = 0 \longrightarrow \alpha\beta = ?$

$x_1 + x_2 = \frac{m+14}{36} \quad x_1 x_2 = \frac{1}{36} \quad a = \sqrt{\frac{1}{x_1}} \quad b = \sqrt{\frac{1}{x_2}}$

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$a^2 + b^2 = \frac{x_1+x_2}{x_1x_2} = m+14 \quad ab = \sqrt{\frac{1}{x_1x_2}} = \sqrt{36} = 6$

$m + 24 = 28 \Rightarrow m = 1 \rightarrow \boxed{x_1x_2 = \frac{2}{m} = \frac{2}{-1} = -2}$

$m = -2$

(3) γ ، ریشه سوم $\alpha\beta = -2 \quad \alpha+\beta = 1 \quad (4x^3 + kx^2 - 9x - 2 = 0)$ β و α

$\alpha+\beta+\gamma = -\frac{k}{4}$

$\alpha\beta\gamma = \frac{1}{2} \rightarrow (-2)\gamma = \frac{1}{2} \quad \gamma = -\frac{1}{4}$

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$\alpha+\beta+\gamma = 1 - \frac{1}{4} = \frac{3}{4} \rightarrow \alpha+\beta+\gamma = -\frac{k}{4}$

$-\frac{k}{4} = \frac{3}{4} \rightarrow \boxed{k = -3}$

$S=-6$ $\quad \alpha\beta=\alpha$ $\quad \alpha,\beta=\dfrac{-6\pm\sqrt{36-4a}}{2} \longrightarrow \alpha<\beta \longrightarrow \alpha=-3-\sqrt{9-a}$ $\quad$ (4

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$3\alpha^2+2\beta^2=\alpha^2+2(S^2-2P)=12\sqrt{2}+85 \longrightarrow a=1$

4) $\alpha,\beta \quad x^2+6x+a=0 \qquad \alpha<\beta<0$

$3\alpha^2+2\beta^2=12\sqrt{2}+85 \qquad a?$ ✓ $\quad$ 1

$\alpha+\beta=-6$

$\alpha^2+\beta^2=(\alpha+\beta)^2-2\alpha\beta=36-2a \longrightarrow 3\alpha^2+2\beta^2=2(\alpha^2+\beta)+(\alpha^2)$

$\alpha=-3-\sqrt{9-a} \qquad \beta=-3+\sqrt{9-a}$

$a^2=9+6\sqrt{9-a}+9-a \longrightarrow a=5$

5) $x^4-7x^2-5=0 \longrightarrow t^2-7t-5=0$

S,P

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

$t=x^2$

$t=\dfrac{7\pm\sqrt{69}}{2} \longrightarrow \dfrac{7-\sqrt{69}}{2}$ ✗

$\searrow \dfrac{7+\sqrt{69}}{2}$ ✓ $\longrightarrow x=\pm\sqrt{\dfrac{7+\sqrt{69}}{2}}$ $\quad$ 2

$S=\sqrt{\dfrac{7+\sqrt{69}}{2}}-\sqrt{\dfrac{7+\sqrt{69}}{2}}=0 \qquad P=-\dfrac{7+\sqrt{69}}{2}$

$2P^2-3SP+3S \longrightarrow S=0 \longrightarrow =2P^2 \longrightarrow P^2=\left(\dfrac{7+\sqrt{69}}{2}\right)^2$

$\boxed{\dfrac{118+14\sqrt{69}}{2}} \qquad 2P^2=\dfrac{(7+\sqrt{69})^2}{2}$

6) $2x^2-ax+b=0 \qquad$ رد $x \qquad 4ax^2+ax-6=0$

$\left[\dfrac{ab}{4}\right]$

$S_2=-\dfrac{a}{4a}=-\dfrac{1}{4} \qquad P_2=-\dfrac{6}{4a}=-\dfrac{3}{2a}$

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$S_1=S_2+1=\dfrac{1}{2} \qquad P_1=P_2+\dfrac{1}{2}S_2+\dfrac{1}{4}=-\dfrac{3}{2}-\dfrac{1}{4}+\dfrac{1}{4}=-\dfrac{3}{2}$

$S_1=\dfrac{a}{2}=\dfrac{1}{2} \quad a=1 \qquad P_1=\dfrac{b}{2}=\dfrac{-3}{2} \quad b=-3$

$\dfrac{ab}{4}=\dfrac{1\times(-6)}{4}=-\dfrac{3}{2} \longrightarrow -2$

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(7) $40\beta^2+20\alpha^2-20\beta=17$ $ax^2-ax-b=0$ β, α

$\alpha-\beta=?$

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

$\alpha^2=(1-\beta)^2=1-2\beta+\beta^2$

$20(3\beta^2-3\beta+1)=17 \to 60\beta^2-60\beta+20=17 \to 60\beta^2-60\beta+3=0$

$20\beta^2-20\beta+1=0$

$\beta=\frac{20\pm\sqrt{400-80}}{40}=\frac{20\pm\sqrt{320}}{40}$

$|\alpha-\beta|=\frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{320}}{20}=\boxed{\frac{\cancel{4}\,2\sqrt{5}}{5}}$

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(8) $x^2-(a+1)x+a=0 \to (2n-1)+(2n+1)=4n=a+1 \Rightarrow a=4n-1$

$(2n-1)(2n+1)=4n^2-1$

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

$\to 2K + 2K+2 = 4K+2 = 3a+1$

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$4K+2=12n-3+1=12n-2 \Rightarrow K=3n-1 \to (2K)(2K+2)=4K(K+1)=4(3n-1)(3n)=36n^2-12n+1-(4n^2-1)=$

$36n^2-12n+1-(4n^2-1)=32n^2-12n+1$

$\boxed{32n^2-12n+1}$

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(9) α,β $x^2+x-1-m^2=0$ $\min\ \alpha^2+\beta^2$

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

$m^2=0 \to \boxed{3}$

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(10) $A(3,9)$, $B(-5,9)$ $\alpha^2+\beta^2=5$ $y=1$

$x=\frac{3+(-5)}{2}=-1 \to (-1,1) \to y=a(x+1)^2+1 \to 0=a(x+1)^2+1 \Rightarrow (x+1)^2=-\frac{1}{a}$

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

$2-\frac{2}{a}=5 \Rightarrow a=-\frac{2}{3}$

$x=0$ $y=a(1)^2+1=1-\frac{2}{3}=\frac{1}{3}$ $\boxed{\left(0,\frac{1}{3}\right)}$

$x_1=1,\ x_2=a \to 3$ (دو عدد فرد متوالی) ۸)

$P_1=3$

$x^2-(3a+1)x+b=0 \to x^2-10x+b=0$

ریشه‌ها ۲ عدد زوج متوالی اند بین a و $a+2$

$S=2\alpha+2=10 \to \alpha=4$

$?_2=24$

$24-3=21$