سایا حادری

DATE / /

SUBJECT :

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

α, β

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

$\longrightarrow 4\beta = \frac{a}{3} \Rightarrow \beta = \frac{a}{12}$

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

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

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

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

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

$m + 24 = 28 \Rightarrow m = 1 \to \boxed{x_1 x_2 = \frac{2}{m} = \frac{2}{-1} = -2}$

$m = -2$

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

$\alpha + \beta + r = -\frac{k}{3}$

$\alpha\beta r = \frac{1}{2} \longrightarrow (-2)r = \frac{1}{2}$ $r = -\frac{1}{4}$

$\alpha + \beta + r = 1 - \frac{1}{4} = \frac{3}{4} \longrightarrow \alpha + \beta + r = -\frac{k}{4}$

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

DATE / / SUBJECT :

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

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

$\alpha+\beta=-6$

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

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

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

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

S , P

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

$t=x^2$

$t=\frac{7\pm\sqrt{69}}{2} \rightarrow \frac{7-\sqrt{69}}{2}$ ✗

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

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

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

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

(6) $2x^2-ax+b=0$ $\quad$ رد x $\quad 2ax^2+ax-6=0$

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

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

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

$S_1=\frac{a}{2}=\frac{1}{2}$, $a=1$ $\qquad P_1=\frac{b}{2}=\ldots$, $b=-6$

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

DATE / / SUBJECT :

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

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

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

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

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

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

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

---

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

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

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

$\rightarrow 2k+2k+2=4k+2=3a+1$

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

$36n^2-12n+1-(4n^2-1)=32n^2-12n+1$ $\boxed{32n^2-12n+1}$

---

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

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

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

---

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

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

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

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

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