Date : Subject :

$-mx^2+mx+1=-m-x$ ۱۰

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

$-mx^2+(m+1)x+m+1=0$

$\Delta<0 \rightarrow m^2+2m+1-4(-m^2-m)<0$

$\rightarrow m^2+2m+1+4m^2+4m<0$

$\rightarrow 5m^2+6m+1<0 \rightarrow m^2+6m+5<0$

$\rightarrow (m+1)(m+5)<0 \rightarrow m=-\frac{1}{5}$, -1

$-1 \quad -\frac{1}{5}$

$+ \quad - \quad +$ ⟶ ۰ غیر صحیح

۲۳ کلیدی — به نام خدا — الیا صفایی

$y=ax^2+bx+c \xrightarrow{(3,1)} 1=9a+3b+c \xrightarrow{①} \boxed{15a+c=1}$ ①

ext $\frac{-b}{2a}=-1 \rightarrow -b=-2a \rightarrow b=2a$ ②

$\frac{-\Delta}{4a}=9 \rightarrow -b^2+4ac=36a$

$(-1,9) \rightarrow 9=a-b+c \xrightarrow{②} \boxed{9=-a+c}$

$\left.\begin{array}{l}15a+c=1\\ -a+c=9\end{array}\right\} 16a=-8 \rightarrow a=-\frac{1}{2}$

$c=\frac{17}{2}$

$b=-1$

$y=-\frac{1}{2}x^2-x+\frac{17}{2}$

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$\Delta>0 \longrightarrow b^2-4ac>0 \longrightarrow m^2-8m-48>0$ ۲

$\rightarrow (m-12)(m+4)$ $\quad \frac{-4 \quad +12}{+ \;0\; - \;0\; +}$ $\quad (-\infty,-4)\cup(+12,+\infty)$

$-\frac{b}{a}>0 \longrightarrow -\frac{m}{2}>0 \longrightarrow m<0$

$(-6,-4)$

$\frac{c}{a}>0 \longrightarrow \frac{m+6}{2}>0 \longrightarrow m>-6$

$3x^2+(2m-1)x+2-m=0$ $\quad \frac{7}{2}$ ۲

$\Delta>0 \rightarrow (2m-2)^2-(4)(3)(2-m)>0 \rightarrow 4m^2+4-4m-24+12m>0$

$\rightarrow 4m^2+8m-20>0$

$-\frac{b}{a}=\frac{a}{c} \rightarrow -bc=a^2 \rightarrow (-1)(2m-1)(2-m)=9$

$\rightarrow 2m^2-5m+2=9$

$\rightarrow 2m^2-5m-7=0$

$\rightarrow m^2-5m-14=0 \rightarrow (m-7)(m+2)=0$

$\rightarrow m \begin{cases} m=-\frac{2}{2}=-1 \; \times \; (\Delta<0) \\ m=\frac{7}{2} \; \checkmark \end{cases}$

$x=x^2-4 \rightarrow x^2-x-4=0 \rightarrow \begin{cases} \alpha^2-\alpha-4=0 \\ \beta^2-\beta-4=0 \end{cases}$ ۲

$S: \alpha+\beta=1 \} P: \alpha\beta=-4$

$\beta^3+\frac{1}{\alpha}, \alpha^3+\frac{1}{\beta}$

جمع ریشه : $\alpha^3+\beta^3+\frac{1}{\alpha}+\frac{1}{\beta}=\alpha^3+\beta^3+\frac{\alpha+\beta}{\alpha\beta}=S^3-3SP+\frac{S}{P}$

$=1+12-\frac{1}{4}=\frac{51}{4}=-\frac{b}{a}\}$ ضرب : $\alpha^3\beta^3+\beta^2+\alpha^2+\frac{1}{\alpha\beta}$

$=S^3-3SP+S^2-2P+\frac{1}{P}$

$=-64+9-\frac{1}{4}=\frac{-221}{4}$

$y=x^2-\frac{51}{4}x+\frac{-221}{4}$

$y=x^2-Sx+P$

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$$\left(\sqrt[3]{x^2}+\frac{1}{\sqrt[3]{x^2}}+1\right)\left(\sqrt[3]{x^2}-1\right)=2\sqrt[3]{x}\xrightarrow{a=\sqrt[3]{x}}\left(a^2+\frac{1}{a^2}+1\right)\times\left(a^2-1\right)=2a$$

$$\to a^4-a^2+1-\frac{1}{a^2}+a^2-1=2a\to a^4-\frac{1}{a^2}=2a$$

$$\xrightarrow{\times a^2} a^6-2a^3-1=0\to x^2-2x-1=0$$

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

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$$3x^2-ax+4=0\xrightarrow{\alpha}3\alpha^2-a\alpha+4=0\quad \boxed{16}$$

$$\to -\frac{b}{a}=\frac{-a}{3}=4\alpha$$

$$\frac{c}{a}=\alpha\times3\alpha=3\alpha^2\qquad\to\frac{c}{a}=3\alpha^2=\frac{4}{3}$$

$$-\frac{b}{a}=3\alpha+\alpha=4\alpha\qquad\to\alpha^2=\frac{4}{9}\to\alpha=\pm\frac{2}{3}$$

$$\alpha=\frac{2}{3}\to3\times\frac{4}{9}+\frac{2}{3}a+4=0\to\frac{16}{3}+\frac{2}{3}a=0\to a=-\frac{\frac{16}{3}}{\frac{2}{3}}=\boxed{-8}$$

$$\alpha=-\frac{2}{3}\to3\times\frac{4}{9}-\frac{2}{3}a+4=0\to\frac{16}{3}-\frac{2}{3}a=0\to a=\frac{\frac{16}{3}}{\frac{2}{3}}=\boxed{8}$$

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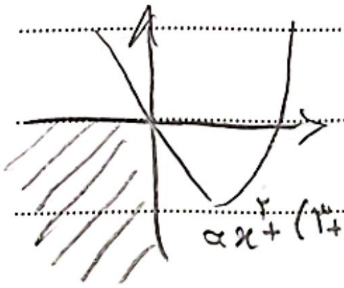

$ax^2+(3+2a)x=y$

مینیمم دار $\Rightarrow\boxed{a>0}$

جمع ریشه‌ها $=-\frac{b}{a}>0$

$$\to\frac{-2a-3}{a}>0\to\frac{2a+3}{a}<0$$

$-\frac{3}{2}$		0	
$+$ 0	$-$	∄	$+$

$$\Rightarrow -\frac{3}{2}<a<0$$

$$a>0\ \cup\ -\frac{3}{2}<a<0=\boxed{\varnothing}$$

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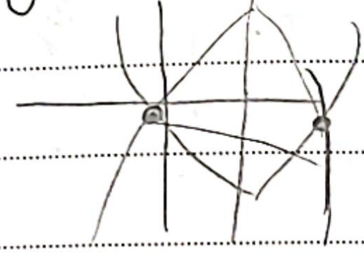
$y = x^2 + ax - 2$, $y = -x^2 - 2x + b$ $\quad x_{ext}: \frac{-b}{2a} = \frac{2}{-2} = \frac{-a}{2}$ 8

$\to a = 2$



$y = x^2 + 2x - 2 \xrightarrow{y=1} 1 = x^2 + 2x - 2$

$\to (x+3)(x-1) = 0$

$\begin{cases} x = 1 \to (1,1) \\ x = -3 \to (-3,1) \end{cases}$

$y = -x^2 - 2x + b \xrightarrow{(-3,1)} 1 = -9 + 6 + b \to b = 4$

$ab = \boxed{8}$

$2ax^2 + ax - 6 = 0 \to \frac{-b}{a} = \frac{-1}{2} \qquad \frac{c}{a} = \frac{-6}{2a} = \frac{-3}{a}$ 9

$2x^2 - ax + b = 0 \to \frac{-b}{a} = \frac{+a}{2} \qquad \frac{c}{a} = \frac{b}{2}$ $\quad 5 \to \boxed{-3}$

$\frac{a}{2} = \cancel{\frac{-1}{2}}^{\,+\frac{1}{2}} = 1 \to a = 1$

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

$(\alpha + \frac{1}{2})(\beta + \frac{1}{2}) = 3 \Rightarrow \frac{1}{4} + \underbrace{(\alpha+\beta)}_{-\frac{1}{2}} \times \frac{1}{2} + \underbrace{\alpha \cdot \beta}_{\frac{b}{2}} = 3$

$\to \frac{1}{4} - \frac{1}{4} + \frac{b}{2} = 3$

$\left[\frac{-6 \times 1}{4}\right] = \left[-\frac{3}{2}\right] = -2$ $\quad \to \frac{b}{2} = 3 \to b = 6$

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$x^{۲} + ۶x + m = ۰$ جمع ریشه ها : $\frac{-b}{a} = \alpha + \beta = -۶$

$x^{۲} + ۲x - ۳m = ۰$ جمع ریشه ها : $\frac{-b}{a} = \alpha + \theta = -۲$

$\theta - \beta = \boxed{۴}$

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