باران عباسی
دهم، فصل ۲

①

$y = a(x-h)^2 + k \longrightarrow a(x+1)^2 + 9$

$1 = a(3+1)^2 + 9 \longrightarrow 1 = 16a + 9 \longrightarrow -8 = 16a \longrightarrow a = \frac{1}{-2}$

$y = \frac{-1}{2}(x+1)^2 + 9$

$y = \frac{-1}{2}(x^2 + 1 + 2x) + 9 \longrightarrow \frac{-1}{2}x^2 - x + \frac{17}{2}$

②

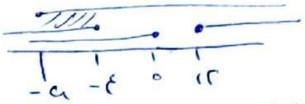
$2x^2 + mx + m + 6 = 0$ $\quad \Delta > 0$

$\Delta = m^2 - 4(2)(m+6) \longrightarrow m^2 - 8m - 48 > 0 \longrightarrow (m-12)(m+4) > 0$

$m > 12$ یا $m < -4$ $\quad \begin{array}{cc} -4 & 12 \\ \hline + \; - & - \; + \end{array}$

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

$x_1 + x_2 \longrightarrow \frac{-b}{a} = \frac{-m}{2} > 0 \longrightarrow m < 0$



$-6 < m < -4$

③

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

$\frac{-b}{a} = \frac{a}{c}$ $\quad \frac{-b}{a} = \frac{-2m-1}{3}$

$\hookrightarrow \frac{-2m+1}{3} = \frac{3}{2-m} \longrightarrow -(2m-1)(2-m) = 9$

$-(-2m^2 + 5m - 2) = 9 \longrightarrow 2m^2 - 5m + 2 = 9 \longrightarrow 2m^2 - 5m - 7 = 0$

$\hookrightarrow \sqrt{\Delta} = (-5)^2 - 4 \times 2 \times (-7)$

$m = \frac{5 \pm 9}{4} \longrightarrow m = -1 \; / \; \frac{7}{2}$

غ ق ق
$\Delta < 0$

④

$\frac{-b}{a} = 1$ $\quad \frac{c}{a} = -4$ $\quad (\underbrace{x_1^3 + x_2^3}) (\underbrace{\frac{1}{x_1} + \frac{1}{x_2}})$

$(x_1 + x_2)^3 - 3x_1x_2(x_1 + x_2) \longrightarrow 1 + 12 = 13$

$\hookrightarrow \frac{x_2 + x_1}{x_1x_2} = \frac{1}{-4}$

$\Big\} \; 13 - \frac{1}{4} = \frac{51}{4}$ جمع

ضرب $\quad (x_1^3 + \frac{1}{x_2})(x_2^3 + \frac{1}{x_1}) \longrightarrow x_1^3x_2^3 + \underbrace{x_1^2 + x_2^2}_{(x_1+x_2)^2 - 2x_1x_2 \longrightarrow 1 + 8 = 9} + \frac{1}{x_1x_2} \longrightarrow -64 + 9 \frac{-1}{4} = \frac{-221}{4}$

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

⑤

$t = \sqrt[3]{x} \longrightarrow (t^2 + \frac{1}{t^2} + 1)(t^2 - 1) = 2t$

$(t^2 - 1)t^2 + (t^2 - 1)\frac{1}{t^2} + (t^2 - 1) \longrightarrow (t^4 - t^2) + (1 - \frac{1}{t^2}) + (t^2 - 1)$ $\quad t^2 - \frac{1}{t^2} = 2t \longrightarrow t^6 - 2t^3 - 1 = 0$ $\quad t^3 = a$

$a^2 - 2a - 1 = 0$

$a = \frac{2 \pm \sqrt{8}}{2} \longrightarrow 1 \pm \sqrt{2}$ $\quad t^3 = 1 \pm \sqrt{2} \longrightarrow t = \sqrt[3]{1 + \sqrt{2}}$

$t^3 = 1 - \sqrt{2} \longrightarrow t = \sqrt[3]{1 - \sqrt{2}}$ $\quad x = t^3$

$x = 1 + \sqrt{2}$
$\quad\; 1 - \sqrt{2}$

$x_1 + x_2 = 1 + \sqrt{2} + 1 - \sqrt{2} = 2$

(۶)

$\frac{-b}{a}=\frac{a}{۳}$ $\frac{c}{a}=\frac{۴}{۳}$

$x_1=۳x_2 \longrightarrow x_1+x_2=۴x_2=\frac{a}{۳} \longrightarrow x_2=\frac{a}{۱۲}$ $x_1=\frac{a}{۴}$

$\frac{a}{۴}\times\frac{a}{۱۲}=\frac{a^2}{۴۸} \longrightarrow \frac{۴}{۳} \longrightarrow a^2=۶۴ \longrightarrow a=\pm۸$ $۸-(-۸)=۱۶$

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(۷)

$\longrightarrow a>۰$ $x,y<۰$

$ax^2+(۳+۲a)x \longrightarrow x(ax+۳+۲a)$

$y<۰ \,,\, x<۰ \longrightarrow$ ناحیه سوم

$y>۰$ $x<۰ \longrightarrow$ ناحیه دوم $\longrightarrow x(ax+(۲a+۳))\geq۰ \longrightarrow x<۰ \left\langle \begin{array}{l} x=۰ \\ x=\frac{-۳+۲a}{a} \end{array}\right.$

$\frac{-۳+۲a}{a}<۰ \longrightarrow x_2<۰$

$y>۰$ $x_2<۰ \longrightarrow a>۰$

$x \longrightarrow -\infty$

$۳+۲a>۰ \longleftarrow a<۰$

$a<-\frac{۲}{۳}$

$-\frac{۳}{۲}<a<۰$ ①

② $\boxed{a>۰}$ ← که از ابتدا و نگذشتن از ناحیه سوم

① ∩ ② = ∅

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(۸)

$۱=x^2+ax-۲ \longrightarrow x^2+ax-۳=۰$

$۱=x^2+۲x-b \longrightarrow x^2+۲x-b+۱=۰$

$\frac{-a}{۲}=\frac{-۲}{۲}=-۱$

$\longrightarrow a=۲$

$۱=x^2+۲x \longrightarrow (x+۳)(x-۱)=۰ \left\langle \begin{array}{l} ۱ \longrightarrow A(۱,۱) \\ -۳ \longrightarrow B(-۳,۱) \end{array}\right.$

$b=۴ \longleftarrow ۱=-۹+۶+b$

$ab=۸$

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(۹)

معادله اول $\begin{cases} S=\alpha+۰٫۵+\beta+۰٫۵=\frac{-۱}{۲}+۱ \longrightarrow \frac{۱}{۲}=\frac{a}{۲} \longrightarrow a=۲ \\ P=(\alpha+۰٫۵)(\beta+۰٫۵)=\frac{-۳}{۲} \longrightarrow \frac{b}{۲} \longrightarrow b=-۳ \end{cases}$

معادله دوم $\begin{cases} S=\alpha+\beta=\frac{-۱}{۲} \\ P=\alpha\beta=-۳a \end{cases}$

$\left[\frac{ab}{۴}\right]=-۲$

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(۱۰)

$K \longrightarrow$ ریشه مشترک

معادله اول $\longrightarrow K^2+۲K-۳m=۰ \longrightarrow ۳m=K^2+۲K \longrightarrow m=\frac{K^2-۲K}{۳}$

معادله دوم $\longrightarrow K^2+۶K+m=۰ \longrightarrow m=-(K^2+۶K$

$\frac{K^2+۲K}{۳}=-K^2-۶K$

$\longrightarrow ۴K^2+۲۰K=۰$

$۴K(\underbrace{K+۵}_{-۵})=۰$

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فرض مسئله غیرصفر

$m=\frac{K^2+۲K}{۳} \longrightarrow \frac{(-۵)^2+۲(-۵)}{۳}=\frac{۲۵-۱۰}{۳}=۵$

$x^2+۲x-۳m \longrightarrow x^2+۲x-۱۵=۰$

$x_1=K=-۵$ $\frac{-b}{a}=-۲$

$x_2=۳$

$۳-(-۱)=۴$

$x^2+۶x+m=x^2+۶x+۵ \longrightarrow ۰ \longrightarrow x_1=-۵$ $\frac{-b}{a}=-۶ \longrightarrow x_2=-۱$