Subject:
Year. Month. Date. ( ) کلاس: دهم ریاضی A   تکلیف شماره ۲۳   فاطمه احمدی

ex $A\left|\begin{matrix}-1\\9\end{matrix}\right. \rightsquigarrow y = ax^2+bx+c \qquad B\left|\begin{matrix}3\\1\end{matrix}\right. \qquad y = a(x+1)^2+9 \xrightarrow{16} 1 = 16a+9 \to 16a = -8,\ a = -\frac{1}{2}$ ۱-

$y = -\frac{1}{2}(x+1)^2+9 = \left(\frac{-x^2}{2} - x - \frac{17}{2}\right)\times 2 = \ll -x^2 - 2x - \frac{17}{2} = y \gg$

$2x^2 + mx + m + 6 = 0$ ۲-

① $\frac{-b}{a} > 0 \rightsquigarrow \frac{-m}{2} > 0 \to -m > 0 \to \overset{*}{m < 0}$ } ② $\frac{c}{a} > 0 \to \frac{m+6}{2} > 0 \to m+6 > 0 \to \overset{*}{m > -6}$

$\Delta > 0 \to m^2 - 4(2)(m+6) = m^2 - 8m - 48 > 0 \rightsquigarrow (m-12)(m+4) > 0 \quad \frac{-4\quad 12}{+\ -\ +} \rightsquigarrow (-\infty, -4) \cup (12, +\infty)$

* اشتراک می‌گیریم جواب‌ها $\Rightarrow \ll -6 < m < -4 \gg$ $\qquad {}^{*}\ -4 > m,\ m > 12$

$-6 \quad -4 \quad 12$

$3x^2 + (2m-1)x + 2 - m = 0 \quad \alpha, \beta \qquad \frac{-b}{a} = \frac{a}{c} \rightsquigarrow \frac{-2m+1}{3} = \frac{3}{2-m} \qquad (\Delta > 0)$ ۳-

$\frac{-b}{a} = \frac{-2m+1}{3} \ /\ \frac{a}{c} = \frac{3}{2-m} \qquad 9 = \underbrace{(-2m+1)(2-m)}_{-4m+2m^2+2-m} \Rightarrow 9 = 2m^2 - 5m + 2$

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

$m^2 - 5m - 14 = 0 \to (m-7)(m+2) = 0 \to \ll m = \frac{7}{2}, -1 \gg$

$m = \frac{7}{2} \to \Delta = 36 - 4(3)\left(-\frac{3}{2}\right) = 54 > 0$ ✓ } $m = -1 \to \Delta = 9 - 4(3)(3) = -27 < 0$ ✗

$\ll m = \frac{7}{2} \gg$

$x^2 - x - 4 = 0 \quad x_1, x_2 \qquad \left(\overset{\alpha_1}{x_2^3 + \frac{1}{x_1}},\ \overset{\alpha_2}{x_1^3 + \frac{1}{x_2}}\right)$ ... معادله ۲ ۴-

$x_1 + x_2 = 1 \ /\ x_1 x_2 = -4 \qquad (x_1^2 = x_1 + 4,\ x_2^2 = x_2 + 4)$

$x_1^3 = x_1(x_1^2) = x_1(x_1+4) = x_1^2 + 4x_1 = (x_1+4) + 4x_1 = 5x_1 + 4 \Rightarrow \left.\begin{matrix} x_1^3 = 5x_1 + 4 \\ x_2^3 = 5x_2 + 4 \end{matrix}\right\}$ *

$\alpha_1 = 5x_2 + 4 + \frac{1}{x_1} \ /\ \alpha_2 = 5x_1 + 4 + \frac{1}{x_2}$

$\alpha_1 + \alpha_2 = 5(x_2 + x_1) + 8 + \left(\frac{1}{x_1} + \frac{1}{x_2}\right) = 5 + 8 - \frac{1}{4} = \ll \frac{51}{4} \gg \left(\frac{-b}{a}\right)'$

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

$\alpha_1 \alpha_2 = \left(5x_2 + 4 + \frac{1}{x_1}\right)\left(5x_1 + 4 + \frac{1}{x_2}\right) = (5x_2)(5x_1) + 20x_2 + 5 + 20x_1 + 16 + \frac{4}{x_2} + 5 + \frac{4}{x_1} + \frac{1}{x_1 x_2}$

$\underbrace{25(x_1 x_2)}_{-100} + \overset{*}{20x_2} + 5 + \overset{*}{20x_1} + 16 + \frac{4}{x_2} + 5 + \frac{4}{x_1} - \frac{1}{4} = -100 + 20 + 5 + 16 - 1 + 5 - \frac{1}{4} = \frac{-221}{4} = \left(\frac{c}{a}\right)$

* $20(x_1 + x_2) = 20 \ /\ 4\left(\frac{1}{x_1} + \frac{1}{x_2}\right) = -1$

$\rightsquigarrow \ll y = 4x^2 - 51x - 221 \gg$

$\left(\sqrt[3]{x^2} + \frac{1}{\sqrt[3]{x^2}} + 1\right)\left(\sqrt[3]{x^2} - 1\right) = 2\sqrt[3]{x} \rightsquigarrow \sqrt[3]{x^4} - \cancel{\sqrt[3]{x^2}} + \cancel{1} - \frac{1}{\sqrt[3]{x^2}} + \cancel{\sqrt[3]{x^2}} - \cancel{1} =$ ۵-

$\sqrt[3]{x^4} - \frac{1}{\sqrt[3]{x^2}} = 2\sqrt[3]{x} \rightsquigarrow \sqrt[3]{x^4} - \frac{1}{\sqrt[3]{x^2}} - 2\sqrt[3]{x} = 0$

$\left(x^{\frac{4}{3}} - x^{-\frac{2}{3}} - 2x^{\frac{1}{3}} = 0\right) x^{\frac{2}{3}} \to x^2 - 1 - 2x = 0 \to x^2 - 2x - 1 = 0$

$\Delta = b^2 - 4ac = 4 - 4(-1)(1) = 8 \to x = \frac{-b \pm \sqrt{\Delta}}{2a} = \frac{2 \pm 2\sqrt{2}}{2} = \frac{\cancel{2}(1 \pm \sqrt{2})}{\cancel{2}} \rightsquigarrow x_1 = 1 + \sqrt{2},\ x_2 = 1 - \sqrt{2}$

$x_1 + x_2 = 1 + \cancel{\sqrt{2}} - \cancel{\sqrt{2}} + 1 = 2 \ /\ \frac{-b}{a} = \frac{-(-2)}{1} = 2$

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$3x^2 - ax + 4 = 0$ $\frac{-b}{a} = \frac{a}{3}\ (x_1 + x_2)$ / $\frac{c}{a} = \frac{4}{3}\ (x_1 \cdot x_2)$ / $x_1 = 3x_2$ —۶

$3x_2 + x_2 = \frac{a}{3} \to 4x_2 = \frac{a}{3} \to x_2 = \frac{a}{12}$

$3x_2 \cdot x_2 = \frac{4}{3} \to 3x_2^2 = \frac{4}{3} \to x_2^2 = \frac{4}{9} \to x_2 = \pm\frac{2}{3}$ / $\frac{2}{3} = \frac{a}{12} \to 24 = 3a \to \boxed{a = 8}$

$\langle\langle |8-(-8)| = 16 \rangle\rangle$ \ $\frac{-2}{3} = \frac{a}{12} \to -24 = 3a \to \boxed{a = -8}$

$y = ax^2 + (3 + 2a)x$ (از ناحیه ۳ نمی‌گذرد) $\to a>0$, $\Delta<0$ { حالت ۱ / حالت ۲ —۷

حالت ۲: $\frac{-b}{a} \geq 0 \to \frac{-3-2a}{a} \geq 0$ $\Rightarrow \frac{-3}{2} \leq a < 0$ ⟶ صفر مقدار صحیح وجود دارد

$-3-2a=0 \to -3 = 2a \to a = \frac{-3}{2}$

حالت ۳: $a = 0 \to y = 3x$ ✗ از ربع ۳ نمی‌گذرد

$y_1 = x^2 + \alpha x - 2$ / $y_2 = -x^2 - 2x + b$ $\to \frac{-a}{2} = \frac{2}{-2} \Rightarrow \boxed{a=2}$ —۸

شرط: $x, y = 1$ $\to y_1 = y_2 \to x^2+2x-2 = -x^2-2x+b \to 2x^2+4x-2 = b$

$x^2+2x-2=1 \to x^2+2x-3=0 \to \langle x^2+2x=3 \rangle$ $\to 2(\underbrace{x^2+2x}_{3}-1) = b \Rightarrow \boxed{b=4}$

$ab = 2\times 4 = 8$

$2x^2 - \alpha x + b = 0$ $\begin{cases} \alpha + \frac{1}{2} = z \\ \beta + \frac{1}{2} = y \end{cases}$ $2\alpha x^2 + ax - 6 = 0$ $\to \alpha, \beta$ $\left[\frac{ab}{4}\right]$ —۹

$z+y = \frac{a}{2}$ / $\alpha+\beta = \frac{-\alpha}{2\alpha} = \frac{-1}{2}$ $\to (z+y) = (\alpha+\beta) + 2(\frac{1}{2}) \Rightarrow \frac{a}{2} = \frac{-1}{2} + 1 = \frac{1}{2} \Rightarrow a=1$

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

$zy = \frac{b}{2} = -3 \Rightarrow b = -6$ } $\left[\frac{ab}{4}\right] = \left[\frac{-6(1)}{4}\right] = \left[\frac{-3}{2}\right] = -2$

$x^2+6x+m=0$, $x^2+2x-3m=0$ $\to a =$ ریشه مشترک —۱۰

$a^2+6a+m=0 \to m = -a^2-6a$ { $a^2+2a-3m=0 \to a^2+2a\overbrace{-3(-a^2-6a)}^{3a^2+18a}=0$

$4a^2+20a=0 \to 4a(a+5)=0 \to a = \cancel{0} / -5$

$m = -a^2-6a \xrightarrow{a=-5} m=5 \Rightarrow$ ① $x^2+6x+5=0 \to (x+1)(x+5)=0 \to x = -1, -5$

② $x^2+2x-15=0 \to (x+5)(x-3)=0 \to x = -5 / 3$ $-5 =$ ریشه مشترک

$|3-(-1)| = 4$ ← اختلاف ریشه‌ها

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