نام و نام خانوادگی ......صبا حنیفی...... ۱۹ پاسخنامه تشریحی تکلیف شماره ..۱۹... کلاس .یازدهم تجربی گروه B

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$3x^2 - ax + 4 = 0 \qquad x_1 + x_2 = \frac{a}{3} \;,\; x_1 x_2 = \frac{4}{3}$

$x_1 = 3x_2 \qquad 3x_2 + x_2 = 4x_2 = \frac{a}{3} \qquad x_2 = \frac{a}{12}$

$\to 3\left(\frac{a}{12}\right)^2 = \frac{4}{3} \to 3 \times \frac{a^2}{144} = \frac{4}{3}$

$a \Rightarrow \frac{a^2}{48} = \frac{4}{3} \to \pm 8$

اختلاف دو مقدار a $\Rightarrow [8-(-8)] = 16$

(۲)

۲

$36x^2 - (m+14)x + 1 = 0 \qquad mx^2 + 3x + 2 = 0$

$\left(\sqrt{\frac{1}{x_2}} + \sqrt{\frac{1}{x_1}} = 5\right)^2 \to \left(\sqrt{\frac{1}{x_1 x_2}}\right)2 + \frac{1}{x_2} + \frac{1}{x_1} = 25$

$\frac{m+14}{36} = x_2 + x_1 \to \frac{1}{36} = x_2 x_1$

$14 + m = \frac{1}{x_2} + \frac{1}{x_1} \to \sqrt{\frac{1}{x_2 x_1}} = \sqrt{36} = 6$

$(6)2 + (14+m) = 25$

$25 = 12 + 14 + m$

$m = -1$

$-x^2 + 3x + 2 = 0$

$\alpha\beta = \boxed{-2}$

(۲)

۳

$4x^3 + kx^2 - 9x - 2 = 0 \qquad \alpha\beta = -2 \qquad \alpha + \beta = 1 \qquad k = ?\ \boxed{-3}$

$x^2 - (\alpha+\beta)x + \alpha\beta = 0 \qquad \overset{-2}{\alpha\beta} u = \frac{1}{2}$

$x^2 - x - 2 = 0 \qquad u = -\frac{1}{4}$

$(x-2)(x+1) = 0 \to x = -1 \;,\; x = 2$

$\alpha + \beta + u = -\frac{k}{4} \to 1 - \frac{1}{4} = -\frac{k}{4}$

(۲)

۴

$x^2 + 6x + a = 0 \qquad \alpha < \beta < 0 \qquad 3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 85 \qquad a = ? = \boxed{1}$ یا $(-3)^2 - (2\sqrt{2})^2$

$\alpha + \beta = -6 \quad \alpha\beta = a \qquad \Delta = 36 - 4a > 0 \to a < 9$

$\alpha = -6 - \beta$ (فرض) $\qquad 3(-6-\beta)^2 + 2\beta^2 = 12\sqrt{2} + 85 \Rightarrow 5\beta^2 + 36\beta + 108 = 12\sqrt{2} \qquad 0 < a < 9$

$\beta = t + 2\sqrt{2} \to \beta = c + d\sqrt{2} \;,\; a = c - d\sqrt{2}$ یا $a = c + d\sqrt{2}$ $\qquad \alpha = -3 - 2\sqrt{2} \;,\; \beta = -3 + 2\sqrt{2}$

$(c - d\sqrt{2})(c + d\sqrt{2}) = -6 \to c = -3 \;,\; \alpha = -3 - d\sqrt{2} \;,\; \beta = -3 + d\sqrt{2}$

$\alpha^2 = 9 + 6d\sqrt{2} + 2d^2 \;,\; \beta^2 = 9 - 6d\sqrt{2} + 2d^2 \Rightarrow$ جایگذاری در رابطه $\Rightarrow 6d = 12 \Rightarrow d = 2$

(۲)

۵

$x^4 - 7x^2 - 5 = 0 \Rightarrow S = 0 \qquad P = \frac{-7+\sqrt{69}}{2} \qquad 2P^2 - 3SP + 2S = ?$

$x^2 = t$

$t^2 - 7t - 5 = 0 \qquad 2P^2 \Rightarrow 2\left(-\frac{7+\sqrt{69}}{2}\right)^2 = \frac{118 + 14\sqrt{69}}{2}$

$t = \frac{7 \pm \sqrt{69}}{2} \qquad \boxed{59 + 7\sqrt{69}}$

$t_1 = \frac{7 + \sqrt{69}}{2} \qquad t_2 = \frac{7 - \sqrt{69}}{2}$

(۲)

۱) $2x^2 - ax + b = 0$ ۲) $x_1 + \frac{1}{2}$ ، $x_2 + \frac{1}{2}$ $-\frac{1}{2} = \frac{a}{29} = x_1 + x_2$ $-\frac{3}{9} = \frac{-6}{29} = x_1 x_2$ ۲) $29x^2 + ax - 6 = 0$ ۱) $x_1 + x_2 = \frac{a}{2}$ $\frac{a}{2} = 1 + (x_1 + x_2)$ $\frac{a}{2} = 1 - \frac{1}{2} \to a = 1$ $\frac{1}{4} + \frac{x_1 + x_2}{2} + x_1 x_2 = \frac{1}{4} - \frac{1}{4} - 3 = -3 \Rightarrow \frac{b}{2} \to b = -6$ $\left[\frac{9b}{4}\right]$ $\left[\frac{17-6}{4}\right] = \left[-\frac{3}{2}\right] = -2$ (د)	۶
$ax^2 - ax - b = 0$ $\alpha + \beta = \frac{a}{a} = 1 \Rightarrow \beta - 1 = \alpha$ $-\frac{b}{a} = \alpha\beta$ $\sqrt{4\alpha\beta - (\beta+\alpha)^2} = \|\beta - \alpha\|$ $\frac{\sqrt{320} \pm 20}{40} = \beta$ $\frac{40\beta^2}{20} + \frac{20\alpha^2}{20} - \frac{20\beta}{20} = \frac{17}{20}$ $20\beta^2 + \alpha^2 - \beta = \frac{17}{20} \to \frac{17}{20} = 2\beta^2 - (\beta - 1)^2 - \beta$ $\left(\frac{17}{20} = 3\beta^2 - 3\beta + 1\right) \times 20$ $20\beta^2 - 20\beta + 1 = 0$ $\alpha - \beta = ?$ $\frac{\sqrt{5}}{5}$ (۱) $\to -4\alpha\beta + (\beta+\alpha)^2 = (\beta - \alpha)^2 \to \frac{1}{5} = (\beta - \alpha)^2 \Rightarrow \|\beta - \alpha\| = \frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}}$	۷
$x^2 - (a+1)x + a = 0$ x_1 ، $x_1 + 2$ $a = 3$ حاصل ضرب ریشه‌ها $3 = P_1$ $\begin{cases} x_1 + (x_1 + 2) = a + 1 \\ x(x+2) = a \end{cases}$ $2x + 2 = a + 1 \Rightarrow a = 2n + 1$ $n^2 + 2n = 2n + 1 \Rightarrow n^2 = 1 \to n = 1$ $x^2 - (3a+1)x + b = 0$ $2x$ ، $2x + 2$ $a = 3$ $\begin{cases} 2x + (2x + 2) = 3a + 1 \\ 2x(2x + 2) = b \end{cases}$ $4x + 2 = 10 \to x = 2$ ریشه‌ها ۴ و ۶ ضرب ریشه‌ها $P_2 = 24$ $\|P_2 - P_1\| = 24 - 3 = 21$ (د)	۸
$x^2 - x - 1 - m^2 = 0$ $x^2 - x - (1 + m^2) = 0$ $S = \frac{1}{\alpha+\beta}$ $P = \frac{-(1+m^2)}{\alpha\beta}$ کمترین مقدار $\alpha^2 + \beta^2 = ? \to S^2 - 2P$ $1^2 - 2[-(1 + m^2)] = 1 + 2 + 2m^2 = 3 + 2m^2$ $m^2 \geq 0 \to$ کمترین مقدار = صفر $3 + 2(0)^2 = 3$ (د)	۹
$A(3,6)$ $B(-5,6) \to$ (اولی سمی) $\to$! عرض سمی هم عرض $x = \frac{3-5}{2} = -1 \to Z(-1,1)$ رأس $y = a(x+1)^2 + 1 \to y = 9(4)^2 + 1 \to 16a + 1$ $-\frac{1}{a} \to \alpha = -1 + \sqrt{-\frac{1}{a}}$ ، $\beta = -1 - \sqrt{-\frac{1}{a}}$ $\alpha + \beta = -2$ $\alpha\beta = 1 + \frac{1}{a}$ $y = a(1)^2 + 1 = -\frac{2}{3} + 1 = \frac{1}{3}$ $\left(0, \frac{1}{3}\right)$ $\alpha^2 + \beta^2 = 5$ $S^2 - 2PS = 5$ $(\alpha + \beta)^2 - 2(\alpha\beta)(\alpha + \beta) = 5$ $4 - 2\left(1 + \frac{1}{a}\right) = 2 - \frac{2}{a}$ برخورد با محور y ← $x = 0$ (د)	۱۰

(۱۷ $\alpha = 1 - \beta$ $40\beta^2 + 20(1-\beta)^2 - 20\beta = 17 \Rightarrow 20\beta(\beta - 1) = -1 \longrightarrow \alpha\beta = \frac{1}{20} = \frac{-b}{a}$ ($\beta - 1 = -\alpha$)

$\Rightarrow a = -20b$ $ax^2 - ax - b = 0 \longrightarrow -20bx^2 + 20bx - b = 0$ $|\alpha - \beta| = \frac{\sqrt{\Delta}}{|a|} = \frac{2}{\sqrt{5}}$