۱۸

نام و نام خانوادگی ...نازنین بریقندی... پاسخنامه تشریحی تکلیف شماره ...۱۹... کلاس ...11A...

۱

$3x^2 - ax + 4 = 0$

$3\alpha , \alpha \longrightarrow P = \frac{c}{a} = \frac{4}{3} = 3\alpha^2 \Rightarrow \alpha^2 = \frac{4}{9} , \alpha = \frac{2}{3} , \frac{-2}{3}$

$S = \frac{-b}{a} = \frac{a}{3} = 4\alpha \rightarrow ① \; 4(\frac{2}{3}) = \frac{a}{3} , a = 8 , ② \; 4(-\frac{2}{3}) = \frac{a}{3} , a = -8$

$a_1 - a_2 = 8 - (-8) = 16$

(۲)

۲

$\sqrt{\frac{1}{\alpha}} + \sqrt{\frac{1}{\beta}} = 5 \xrightarrow{\text{توان ۲}} \frac{1}{\alpha} + \frac{1}{\beta} + 2\sqrt{\frac{1}{\alpha\beta}} = 25 \quad \frac{\overbrace{\beta+\alpha}^{S}}{\underbrace{\alpha\beta}_{P}} + 2\sqrt{\frac{1}{\underbrace{\alpha\beta}_{P}}} = 25$

$S = \frac{m+14}{36} , P = \frac{1}{36} \longrightarrow \frac{\frac{m+14}{36}}{\frac{1}{36}} + 2\sqrt{\frac{1}{\underbrace{\frac{1}{36}}_{6}}} = m+14+2(6) = 25 \Rightarrow m = -1$

$mx^2 + 3x + 2 = 0 \xrightarrow{m=-1} -x^2 + 3x + 2 = 0 \Rightarrow P = \frac{c}{a} = -2$

(۲)

۳

$4x^3 + Kx^2 - 9x - 2 = 0 \xrightarrow{\text{معادله دارای ۳ ریشه}} \alpha\beta \times x_3 = \frac{-(-2)}{4} = \frac{1}{2} , \alpha\beta = -2 \Rightarrow -2x_3 = \frac{1}{2} , x_3 = -\frac{1}{4}$

$\alpha + \beta + x_3 = \frac{-K}{4} , \alpha + \beta = 1 , x_3 = -\frac{1}{4} \Rightarrow 1 - \frac{1}{4} = \frac{-K}{4} , \frac{3}{4} = \frac{-K}{4} \Rightarrow K = -3$

(۲)

۴

$S = \alpha + \beta = -6 , P = \alpha\beta = a$

$3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 85 \rightarrow \alpha^2 + 2(\alpha^2+\beta^2) = 12\sqrt{2} + 85 \;/\; \alpha^2 + \beta^2 = (\alpha+\beta)^2 - 2\alpha\beta = 36 - 2a$

$x = \frac{-6 \pm \sqrt{36-4a}}{2} = -3 \pm \sqrt{9-a} \xrightarrow{\alpha<\beta} \alpha = -3 - \sqrt{9-a} , \beta = -3 + \sqrt{9-a} \Rightarrow \alpha^2 = \underbrace{(-3-\sqrt{9-a})^2}_{18 - a + 6\sqrt{9-a}}$

$2(\alpha^2+\beta^2) + \alpha^2 = 12\sqrt{2} + 85 \longrightarrow \underbrace{2(36-2a) + 18 - a + 6\sqrt{9-a}}_{90 - 5a + 6\sqrt{9-a}} = 12\sqrt{2} + 85 \longrightarrow 90 - 5a = 85 \rightarrow a = 1$

$6\sqrt{9-a} = 12\sqrt{2} \rightarrow \sqrt{9-a} = 2\sqrt{2} , a = 1$

$a = 1$

(۲)

۵

$S = \frac{-b}{a} = 7 , P = \frac{c}{a} = -5$

$2P^2 - 3SP + 2S \longrightarrow 2(-5)^2 - 3(7)(-5) + 2(7) = 169$

(۰)

$t^2 - 7t - 5 = 0 \rightarrow t = \frac{7 \pm \sqrt{69}}{2}$

غ ق ق

$x^2 = \frac{7+\sqrt{69}}{2} \rightarrow \begin{cases} x_1 = \sqrt{\frac{7+\sqrt{69}}{2}} \\ x_2 = -\sqrt{\frac{7+\sqrt{69}}{2}} \end{cases} \longrightarrow S = 0 , P = \left(-\frac{7+\sqrt{69}}{2}\right)$

$2P^2 - 3SP + 2S = 59 + 7\sqrt{69}$

$2x^2 - ax + b = 0 \to \alpha , \beta$ / $2ax^2 + ax - 6 = 0 \to \alpha' , \beta'$ $\alpha = \alpha' + 0.5$ و $\beta = \beta' + 0.5$

$S = +\frac{a}{2}$ $P = \frac{b}{2}$ $S = \frac{-a}{2a}$ $P = -3$

$\alpha + \beta = \alpha' + \beta' + 1 \to \frac{a}{2} = \frac{-a}{2a} + 1 = \frac{1}{2}$ ؛ $a = 1$ ۶

$\alpha\beta = \frac{b}{2} = -3 \Rightarrow b = -6$ $\left[\frac{ab}{4}\right] = \left[\frac{-6}{4}\right] = -2$

$ax^2 - ax - b = 0 \to S = \frac{-b}{a} = 1 \to \alpha + \beta = 1 , \alpha = 1 - \beta$

$40\beta^2 + 20(1-\beta)^2 - 20\beta = 17 \to 40\beta^2 + 20\beta^2 - 40\beta - 20\beta + 20 = 17 \to 60\beta^2 - 60\beta + 3 = 0$ و $S = 1 , P = \frac{1}{20}$

$\alpha\beta = \frac{-b}{a} = \frac{1}{20} \Rightarrow \frac{b}{a} = \frac{-1}{20}$ ۷

اختلاف ریشه‌ها $= \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{(-a)^2 - 4a(-b)}}{|a|} = \frac{\sqrt{a^2 - 4ab}}{|a|} = \sqrt{1 + 4\frac{b}{a}} = \sqrt{1 + 4(-\frac{1}{20})} = \sqrt{1 - \frac{1}{5}} = \sqrt{\frac{4}{5}} = \frac{2}{\sqrt{5}}$

$x^2 - (a+1)x + a = 0$ $n , n+2$

جمع ریشه‌ها $= n + n + 2 = 2n + 2$ و $\alpha + \beta = a + 1 \Rightarrow a + 1 = 2n + 2 \Rightarrow a = 2n + 1$

ضرب ریشه‌ها $= n(n+2) = n^2 + 2n$ و $\alpha\beta = a \Rightarrow a = n^2 + 2n = \underline{3}$

$\Big\}\ n^2 + 2n = 2n + 1 , n = 1 \Rightarrow a = 2 + 1 = 3$

$x^2 - (3a+1)x + b = 0 \Rightarrow 2k , 2k+2$ ۸

جمع ریشه‌ها $= 4k + 2$ و $\alpha + \beta = 3a + 1 \Rightarrow 4k + 2 = 10 , k = 2$

ضرب ریشه‌ها $= 4k(k+1) = 4 \times 2 \times 3 = 24$ اختلاف ضرب‌هایشان $= |24 - 3| = 21$

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

$\alpha^2 + \beta^2 = S^2 - 2P \to 1 + 2(1 + m^2) = 3 + 2m^2 \Rightarrow$ کمترین مقدار زمانی است که $m = 0$ و برابر با ۳ است

کمترین مقدار $\alpha^2 + \beta^2$ با $m = 0$ می‌دهد $\underline{3}$ ۹

$(3, y)\ (-5, y)\ \alpha^2 + \beta^2 = 5$ $y = a(x - x_1)(x - x_2)$

$x = \frac{\alpha + \beta}{2} = 1 \Rightarrow \alpha + \beta = 2$ / $\alpha^2 + \beta^2 = (\underbrace{\alpha + \beta}_{2})^2 - 2\alpha\beta = 5 \Rightarrow -2\alpha\beta = 5 - 4 = 1 , \alpha\beta = -\frac{1}{2}$

محل برخورد با محور yها $x = 0$ $\to y = a(0 - \alpha)(0 - \beta) = a\alpha\beta$ / رأس سهمی $\to y = a(1 - \alpha)(1 - \beta) = 1 - (\underbrace{\alpha + \beta}_{2}) + \alpha\beta = -\frac{3}{2}$ ۱۰

$y = -\frac{3}{2}a \to a = \frac{-2}{3} \to \underset{\text{برخورد با محور yها}}{y} = a\alpha\beta = -\frac{2}{3} \times (-\frac{1}{2}) = \frac{1}{3}$