نام و نام خانوادگی ......هلیا عطایی...... پاسخنامه تشریحی تکلیف شماره ...19... کلاس ...یازدهم تجربی C...

1

$3x^2 - ax + 4 = 0 \qquad 3\beta = \alpha$

$\alpha\cdot\beta = \frac{c}{a} = \frac{4}{3} \rightarrow \alpha\beta = 3\beta(\beta) = 3\beta^2 = \frac{4}{3}$

$\rightarrow \beta^2 = \frac{4}{9}$ $(+)$: $\beta = \frac{2}{3}$, $\alpha = 2$; $(-)$: $\beta = \frac{-2}{3}$, $\alpha = -2$

$\xrightarrow{x=2} 3(4) - a(2) + 4 = 0$

$16 - 2a + \cancel{4} = 0$; $a = 8$

اختلاف دو مقدار a : $(8-(-8)) = 16$

$\xrightarrow{x=-2} 3(4) - a(-2) + 4 = 0 \rightarrow 16 + 2a + \cancel{4} = 0$; $a = -8$

2

$36x^2 - (m+14)x + 1 = 0 \qquad \alpha+\beta = \frac{-b}{a} = \frac{m+14}{36}$

$\sqrt{\frac{1}{\alpha}} + \sqrt{\frac{1}{\beta}} = 5 \qquad \alpha\cdot\beta = \frac{c}{a} = \frac{1}{36} \rightarrow \frac{1}{\alpha\beta} = 36$

$\downarrow ()^2$

$\frac{1}{\alpha} + \frac{1}{\beta} + 2\sqrt{\frac{1}{\alpha\beta}} = 25$

$\frac{\beta+\alpha}{\alpha\beta} + 2\sqrt{\frac{1}{\alpha\beta}} = 25 \rightarrow \frac{m+14}{\cancel{36}} \times \cancel{36} + 2\sqrt{36} = 25 \rightarrow m + 14 + 12 = 25 \rightarrow m = -1$

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

$\frac{c}{a} = \alpha'\beta' =$ حاصلضرب ریشه‌ها

$\alpha'\beta' = \frac{c}{a} = \frac{2}{m} = \frac{2}{-1} = -2 \rightarrow$ جواب

3

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

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

$\alpha + \frac{-2}{\alpha} = 1 \xrightarrow{\times(\alpha)} \alpha^2 - \alpha - 2 = 0 \rightarrow \begin{cases} \alpha = -1 \\ \alpha = 2 \end{cases}$; $-2+1=-1$; $= \frac{-c}{a}$

$\xrightarrow{x=-1} -\cancel{4} + k + \cancel{9} - \cancel{2} = 0 \rightarrow k = -3$

$\xrightarrow{x=2} 4(8) + k(4) - 9(2) - 2 = 4k = -12 \rightarrow k = -3$

4

$x^2 + 6x + a = 0 \qquad 3\alpha^2 + 2\beta^2 = 12\sqrt{2} + 85 \qquad \alpha < \beta < 0 \qquad a = ? \rightarrow a = 1$

$2.5\alpha^2 + 0.5\alpha^2 \qquad 2.5\beta^2 - 0.5\beta^2$

$\alpha + \beta = \frac{-b}{a} = -6$

$\alpha\cdot\beta = \frac{c}{a} = a \ , \ a > 0$

$\alpha^2 + \beta^2 = S^2 - 2P = 36 - 2a$

$\alpha^2 - \beta^2 = (\alpha+\beta)(\alpha-\beta) = -6(2\sqrt{9-a}) = -12\sqrt{9-a}$

$\alpha - \beta = \frac{\sqrt{\Delta}}{|a|} = \sqrt{36-4a} = 2\sqrt{9-a}$

$2.5\alpha^2 + 2.5\beta^2 + 0.5\alpha^2 - 0.5\beta^2 = 12\sqrt{2} + 85$

$2.5(36 - 2a) + 0.5(-12\sqrt{9-a}) = 12\sqrt{2} + 85 \rightarrow 90 - 5a - 6\sqrt{9-a} = 12\sqrt{2} + 85$

$5 - 12\sqrt{2} - 5a = 6\sqrt{9-a} \xrightarrow{()^2} \cancel{25 + 288}^{313} - 120\sqrt{2} + 25a^2 - 50a + 120\sqrt{2}a = 324 - 36a$

$-14a \qquad 11$

$25a^2 - 14a - 11 = 0$

$a = 1$ ق ق ✓

$a = \frac{-11}{25}$ غ ق ق ; $\alpha\cdot\beta = a > 0$

5

$x^4 - 7x^2 - 5 = 0 \qquad A = 2P^2 - 3SP + 2S = ?$

$x^2 = t \rightarrow t^2 - 7t - 5 = 0 \rightarrow \Delta = 49 - 4(1)(-5) \rightarrow \Delta = 69$

$t = \frac{-b \pm \sqrt{\Delta}}{2a} \rightarrow t = \frac{7 \pm \sqrt{69}}{2}$

$t = \frac{7 - \sqrt{69}}{2}$ غ ق ق $(t = x^2)$ نمی‌تواند منفی باشد

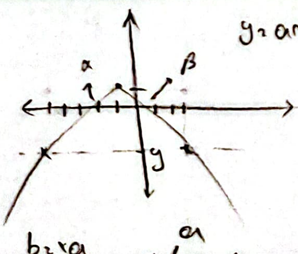
$t = \frac{7 + \sqrt{69}}{2} = x^2$ ق ق $\rightarrow x = \pm\sqrt{\frac{7+\sqrt{69}}{2}} \rightarrow$ جمع $S = \sqrt{\frac{7+\sqrt{69}}{2}} - \sqrt{\frac{7+\sqrt{69}}{2}} = 0$

$\rightarrow S = 0$

$P = \sqrt{\frac{7+\sqrt{69}}{2}} \times -\sqrt{\frac{7+\sqrt{69}}{2}} = -\frac{7+\sqrt{69}}{2}$

$\rightarrow 2\left(\frac{-7-\sqrt{69}}{2}\right)^2 = \cancel{2}\left(\frac{\overbrace{49+69}^{118} + 14\sqrt{69}}{\cancel{4}_{2}}\right)$

$A = 59 + 7\sqrt{69}$

۶	$2x^2 - ax + b = 0 \to \alpha,\beta$ $2ax^2 + ax - 6 = 0 \to \alpha',\beta'$ $\left[\frac{ab}{4}\right] = -2$ $\alpha+\beta = \frac{a}{2}$ $\alpha'+\beta' = -\frac{a}{2}$ $\alpha\cdot\beta = \frac{b}{2}$ $\alpha'\cdot\beta' = -3$ $\alpha = \frac12 + \alpha'$, $\beta = \frac12 + \beta'$ $\to \underbrace{\alpha+\beta}_{\frac a2} = 1 + \underbrace{\alpha'+\beta'}_{-\frac a2} \to \frac{\cancel{2}a}{\cancel{2}} = 1 \to a = 1$ $\left[\frac{ab}{4}\right] = \left[\frac{-6}{4}\right] = \left[-\frac32\right] = [-1.5] = -2$ جواب $\alpha\beta = \alpha'\beta' + \frac12(\alpha'+\beta') + \frac14 \to \frac b2 = -3 + \frac12\left(-\frac{\cancel{a}}{2}\right) + \frac{\cancel{1}}{\cancel{4}} \to b = -6$	
۷	اختلاف ریشه‌های این معادله؟ $ax^2 - ax - b = 0 \to \alpha,\beta$ ریشه‌اند $20\beta^3 + 20\alpha^2 - 20\beta = 17$ $\to 20\beta^2 + 20\beta^2$ $\alpha+\beta = \frac{-b}{a} = 1$, $\alpha\beta = \frac ca = \frac{-b}{a} \to \alpha^2+\beta^2 = S^2 - 2P = 1 - 2\left(-\frac ba\right) = 1 + \frac{2b}{a}$ $x = \beta \to a(\beta^2 - \beta) = b \to \beta^2 - \beta = \frac ba$ $20\beta^2 + 20\alpha^2 + 20\beta^2 - 20\beta = 17 \to 20\left(\underbrace{(\beta^2+\alpha^2)}_{1+\frac{2b}{a}} + \underbrace{(\beta^2-\beta)}_{\frac ba}\right) = 17$ $ax^2 - ax + \frac{a}{20} = 0$ $(\Delta = b^2 - 4ac)$ $1 + \frac{2b}{a} + \frac ba = \frac{17}{20} \to \frac{3b}{a} = \frac{17-20}{20} = -\frac{3}{20} \to \frac{\cancel{3}b}{a} = -\frac{\cancel{3}}{20} \to \frac ba = -\frac{1}{20} \to b = -\frac{a}{20} \to \Delta = \frac{4a^2}{5}$ اختلاف ریشه‌ها $|\alpha-\beta| = \frac{\sqrt\Delta}{\lvert a\rvert} \Rightarrow \lvert\alpha-\beta\rvert = \frac{\sqrt{\frac{4a^2}{5}}}{\lvert a\rvert} = \frac{2\lvert a\rvert}{\sqrt5} \times \frac{1}{\lvert a\rvert} = \frac{2}{\sqrt5} \times \frac{\sqrt5}{\sqrt5} = \frac{2\sqrt5}{5} \to$ اختلاف ریشه‌ها	
۸	$x^2 - (a+1)x + a = 0$ α و β دو فرد متوالی $x^2 - (3a+1)x + b = 0$ α' و β' دو عدد زوج متوالی $= 2t, 2t+2$ جواب $\alpha = 2k+1$, $\beta = 2k+3$ $\alpha'+\beta' = \frac{-b}{a} = 3a+1$ $\Delta P = \lvert\alpha\beta - \alpha'\beta'\rvert = \lvert a-b\rvert = 24-3 = 21$ $\alpha+\beta = \frac{-b}{a} = a+1$ $2t + 2t + 2 = 4t + \cancel{1} = 3a + \cancel{1} \to 4t = 3a - 1 \to \begin{cases} a = 3 \to 4t = 8 \to t = 2 \\ a = -1 \to 4t = -4 \to t = -1 \text{ غ ق ق} \end{cases}$ $\to 2k + \cancel{1} + 2k + 3 = a + \cancel{1} \to 4k = a - 3$ $\alpha'\beta' = b \to 4t^2 + 4t = b$ $\alpha\cdot\beta = \frac ca = a \to (2k+1)(2k+3) = 4k^2 + 8k + 3 = a$ $4(4) + 4(2) = b \to 24 = b$ $4 - 4 = b$ $\lvert b - a\rvert = 24 - 3 = 21$ جواب $\to 4k^2 + 2(a-3) + 3 = a \to 4k^2 + \cancel{2a} - \cancel{6} + \cancel{3} = \cancel{a}$ $\to 4k^2 + 4k = 0 \to k^2 + k = 0 \to k(k+1) = 0 \to \begin{cases} k = 0 \to 1, 3 \text{ ق ق} \to a = 3 \\ k = -1 \to -1, 1 \to a = -1 \end{cases}$ غ ق ق چون $b = \alpha'\beta' = 0$ در ندارد	
۹	$x^2 - x - 1 - m^2 = 0$ $\alpha^2+\beta^2 = ?$ (min) $\alpha+\beta = \frac{-b}{a} = \frac11 = 1$ $\alpha\cdot\beta = \frac ca = -m^2 - 1$ $\alpha^2+\beta^2 = S^2 - 2P = 1 - 2(-m^2-1) = 1 + 2m^2 + 2 \to \alpha^2+\beta^2 = 3 + 2m^2$ m^2 کمترین مقدار $= 0 \to m = 0 \to (\alpha^2+\beta^2)_{min} = 3$ $m_{min} = \frac{-b}{2a} = 0$	
۱۰	$x_{min} = \frac{3-5}{2} = \frac{-2}{2} = -1$ $y = ax^2 + bx + c \to y = ax^2 + 2ax + a + 1$ $\alpha^2+\beta^2 = 5$ $y_{min} = 1$  $\alpha+\beta = \frac{-b}{a} = \frac{-2\cancel{a}}{\cancel{a}} = -2$ $\alpha^2+\beta^2 = S^2 - 2P$ $x_{min} = \frac{-b}{2a} = -1 \to b = 2a$ $\alpha\cdot\beta = \frac ca = \frac{a+1}{a}$ $= \cancel{4} - 2\left(\frac{a+1}{a}\right) = \cancel{5}$ $\to \frac{a+1}{a} = -\frac12$ $y_{min} = -\frac{\Delta}{4a} = \frac{-b^2 + 4ac}{4a} \xrightarrow{b = 2a} \frac{-\cancel{4}a^2 + \cancel{4}ac}{\cancel{4}a} = 1 \to -a + c = 1 \to c = a + 1$ $\to 2a + 2 = -a$ $3a = -2$ $a = -\frac23$ $c = a + 1 \to c = -\frac23 + \frac33 = \frac13 \to$ عرض از مبدا $\to$ با عرض $\frac13$ محور y ها را قطع می‌کند	