امیر محمد فروجانی

یازدهم ریاضی B

تکلیف ۱۳

$y=(a-1)x^2+x+3$ $\quad -\frac{b}{2a}=2 \to \frac{-1}{2a-2}=2 \to 3=4a \to a=\frac{3}{4}$

$(\frac{3}{4}-1)x^2+x+3 \to -\frac{x^2}{4}+x+3 \xrightarrow{\times -4} x^2-4x-12=0 \to (a-6)(a+2)=0$

(6)

$f(x)=mx^2-5x+m \quad m<0$

$x_1 \; x_2$

$- \; | + | \; -$

$x=\frac{5 \pm \sqrt{25-4m^2}}{2m}$ $\quad \Delta=25-4(m)(m)$

$\to 25-4m^2>0 \to m<\frac{5}{2} \to -\frac{5}{2}<m<0$

$(-\frac{5}{2}, 0)$

$S=\frac{3-\sqrt{5}}{3}+\frac{3+\sqrt{5}}{3}=\frac{6}{3}=2$ $\quad P=\frac{(3-\sqrt{5})}{3}\times\frac{(3+\sqrt{5})}{3}=\frac{4}{9}$

$x^2-2x+\frac{4}{9}=0 \xrightarrow{\times 9} 9x^2-18x+4=0$

$2x^2-8x+m+2=0 \quad \alpha<\beta \quad 3\alpha^2+\beta^2=12 \to \alpha+\beta(3\alpha+\beta)=12$ $\quad m=?$

$-\frac{b}{a}=\alpha+\beta=4 \to \beta=4-\alpha$

$3\alpha^2+(4-\alpha)^2=12 \to 3\alpha^2+16+\alpha^2-8\alpha=12$

$\frac{8}{2}$ $\quad 4\alpha^2-8\alpha+16=12 \to 4\alpha^2-8\alpha+4=0 \xrightarrow{\div 4} \alpha^2-2\alpha+1=0 \to (\alpha-1)^2=0$

$\beta=4-1=3 \quad \alpha\times\beta=3=\frac{m+2}{2} \to m+2=6 \to m=4$ $\quad \alpha=1$

$S(2,9)$ $\quad y=a(x-2)^2+9 \to y=0 \to 0=a(5-2)^2+9 \to 9a+9=0$

$y=a(x-h)^2+k$ $\quad -(x-2)^2+9=-x^2-4+4x+9 \to -x^2+4x+5$ $\quad -9=9a \quad a=-1$

$\Rightarrow x^2-4x-5>0 \to (x-5)(x+1)>0 \to$ $\quad \begin{matrix} -1 & 5 \\ + | & - | + \end{matrix}$ $\to y>0 \to -x^2+4x+5>0$

$(5,+\infty) \cup (-\infty,-1)$

امیر محمدفروهان

$a x^2 - 7x + 9\beta = 0 \quad \beta > 0 \quad \frac{1}{\alpha}+\frac{1}{\beta} = ?$

$a^2 - 7a + 9\beta = 0$

$\frac{9\beta}{a} = a\beta \rightarrow a = 3 \rightarrow 3x^2 - 7x + 9\beta = 0$

$a = -3 \rightarrow -3x^2 - 7x + 9\beta = 0 \quad \Delta > 0 \rightarrow \beta > 0$ ✓

$\Delta = 49 - 4(3)(9\beta) \quad 49 - 4(-3)$

$\frac{1}{a}+\frac{1}{\beta} \rightarrow \frac{1}{-3}+\frac{1}{\frac{2}{3}}$

$-\frac{b}{a} = \frac{7}{a} = -\frac{7}{3} = -3 + \beta$

$= \frac{1}{-3} + \frac{3}{2} = \frac{-2+9}{6} = \frac{7}{6}$

$-7 = -9 + 3\beta \rightarrow 3\beta = 2 \rightarrow \beta = \frac{2}{3}$

$x^2 + mx - 2m = 0 \quad \alpha^2 - m\beta = 8 \quad S = ?$

$\alpha^2 + m\alpha - 2m = 0 \rightarrow \alpha^2 = 2m - m\alpha$

$S = -\frac{b}{a} \rightarrow -\frac{m}{1} \quad P = \frac{c}{a} \rightarrow \frac{-2m}{1} = -2m$

$\alpha^2 - m\beta = 8 \rightarrow 2m - m\alpha - m\beta = 8$

$-m(-2 + \alpha + \beta) = 8$

$2m + m^2 = 8 \rightarrow m^2 + 2m - 8 = 0 \rightarrow (m+4)(m-2) = 0 \quad m = -4 \;,\; 2$

$\alpha + \beta = -4 + 2 = -2$

$\alpha + \beta = 4$

$y = mx^2 + 4x + \frac{m}{2} + 7 \quad m < 0$

$-\frac{b}{2a} = -\frac{4}{2m} = \frac{-2}{m} \rightarrow m\left(\frac{-2}{m}\right)^2 + 4\left(\frac{-2}{m}\right) + \frac{m}{2} + 7 = 8 \rightarrow \frac{4}{m} - \frac{8}{m} + \frac{m}{2} + 7$

$-\frac{\Delta}{4a} \rightarrow \frac{-(16 - 4(m)(\frac{m}{2}+7))}{4m} = 8 \rightarrow \frac{-16 + 2m^2 + 28m}{4m} = 8 \rightarrow m^2 + 14m - 8 = 16m$

$2m^2 - 4m - 16 = 0 \rightarrow (m-8)(m+4) = -\frac{4}{2} \;,\; \frac{8}{2} \rightarrow m<0 \rightarrow -2 = m$

$-2x^2 + 4x - 1 + 7 \rightarrow -2x^2 + 4x + 6 \rightarrow x^2 + 4x - 12 = 0 \rightarrow (x+6)(x-2) = 0 \quad 2 \;,\; -6$

$c = 4 \quad -\frac{b}{2a} = 2 \rightarrow \frac{1}{2}\left(-\frac{b}{a}\right) = 2 \rightarrow -\frac{b}{a} = 4 \rightarrow S = 4$

$-\frac{b}{2a} = 2 \quad b = -4a$

$ax^2 - 4ax + 4 = 0 \rightarrow a(x^2 - 4x) + 4 = 0$

$-\left(\frac{-4a}{2a}\right) = 2$

$\frac{c}{a} = \frac{4}{a} \quad a(x-2)^2 = 0 \rightarrow a = 1 \quad x = 2$

$\frac{1}{\alpha} + \frac{1}{\beta} \rightarrow \frac{\alpha + \beta}{\alpha\beta} \rightarrow \frac{2a}{a} \times \frac{a}{4} = \frac{2a}{4} \rightarrow \frac{a}{2} = \frac{2}{2} = 1$

$x^2 - (4a+4)x + (3a^2 + 6a + 3) = 0 \quad x_1 = 2 \quad x_2 = ?$

$2) \quad 4 - (4a+4)2 + (3a^2 + 6a + 3) = 0 \rightarrow 3a^2 - 2a - 1 = 0 \rightarrow a^2 - 2a - 3 = 0$

$(a-3)(a+1) = 0 \quad -\frac{1}{3} \;,\; 1$

$S = \frac{-b}{a} \rightarrow 4a + 4 = x_1 + x_2 \rightarrow x_2 = 4a + 4 - x_1 \rightarrow 4a + 4 - 2 = 4a + 2 \xrightarrow{a=1} 4 + 2 = 6$

$\xrightarrow{a = -\frac{1}{3}} -\frac{4}{3} + 2 = \frac{2}{3}$