Subject:
Year. Month. Date. ( )

دریا یالی زاده رستم

①

$-\frac{b}{2a} = 2 \to \frac{-1}{2a-2} = 2 \to 4a-4=-1$

$4a = 3 \to a = \frac{3}{4}$

$-\frac{1}{4}x^2 + x + 3 = 0 \to x^2 - 4x - 12 \to (x-6)(x+2) = 0 \to \begin{cases} \boxed{x=6} \checkmark \\ x=-2 \text{ غق} \end{cases}$

②

$f(x) = mx^2 - 5x + m$

	x_1		x_2	
$-$		$+$		$-$

① $\boxed{m<0} \to$ باتوجه به جدول

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

① $\cap$ ② $\to \boxed{-\frac{5}{2} < m < 0}$

③

$x^2 - Sx + P \Rightarrow x^2 - 2x + \frac{4}{9} \to \boxed{9x^2 - 18x + 4 = 0}$

$S = \frac{3+\sqrt{5}}{3} + \frac{3-\sqrt{5}}{3} = \frac{6}{3} = 2$

$P = \frac{3+\sqrt{5}}{3} \times \frac{3-\sqrt{5}}{3} = \frac{9-5}{9} = \frac{4}{9}$

④

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

$\boxed{m = 4}$

$S = \frac{8}{2} \to \alpha + \beta = 4 \to \beta = 4 - \alpha$

$3\alpha^2 + (4-\alpha)^2 = 12 \to 3\alpha^2 + 16 + \alpha^2 - 8\alpha = 12 \to 4\alpha^2 - 8\alpha + 4 = 0$

$\to \alpha^2 - 2\alpha + 1 = 0 \to \boxed{\alpha = 1}$

⑤

$S(2, 9)$

$y = a(x-2)^2 + 9$

$4a + 9 = 5 \to a = -1$

$-(x-2)^2 + 9 > 0$

$(x-2)^2 - 9 < 0 \to x^2 - 4x + 4 - 9 < 0$

$x^2 - 4x - 5 < 0 \to (x-5)(x+1) < 0 \Rightarrow$

	-1		5	
$+$	0	$-$	0	$+$

$\to (-1, 5)$

(۶)

$\alpha x^2 - 7x + 9\beta = 0$

$\frac{1}{\alpha} + \frac{1}{\beta} = 0$ $\quad P \Rightarrow \alpha\beta = \frac{9\beta}{\alpha} \to \alpha^2\beta = 9\beta \to \alpha = \pm 3$

$S = \alpha + \beta = \frac{7}{\alpha}$

$\alpha = +3 \to \frac{7}{3} = 3 + \beta \Rightarrow \beta = -\frac{2}{3}$ ق ع

$\alpha = -3 \to -\frac{7}{3} = -3 + \beta \to \boxed{\beta = \frac{2}{3}} \checkmark$ $\quad \alpha = -3$, $\beta = \frac{2}{3}$ $\quad -\frac{1}{3} + \frac{3}{2} = \frac{7}{6}$

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$\alpha^2 + m\alpha - 2m = 0$ $\quad \beta^2 + m\beta - 2m = 0 \to \beta^2 - 2m = -m\beta$

$\alpha^2 - m\beta = 8 \rightsquigarrow \underbrace{\alpha^2 + \beta^2}_{S^2 - 2P} - 2m + 8 \to m^2 + 4m - 2m - 8 = m^2 + 2m - 8$

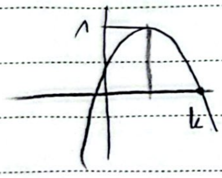
$(m+4)(m-2) \to m = -4$, $m = 2$

$m = -4 \to x^2 - 4x + 8 \to \Delta < 0$ ریشه ندارد

$m = 2 \to x^2 + 2x - 4 \to S = -\frac{b}{a} = -2$

(۸)

$f(x) = mx^2 + 4x + \frac{m}{2} + 7 \to m < 0 \to \max$



$\frac{-\Delta}{4a} = 8 \to -\Delta = 32a \to -(16 - 4(m)(\frac{m}{2} + 7)) = 32m$

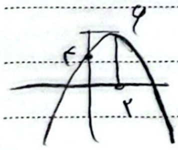
$-16 + 2m^2 + 28m = 32 \to 2m^2 - 4m - 16 = 0$

$m^2 - 2m - 8 = 0 \to (m-4)(m+2) \to m = 4$ ✗, $\boxed{m = -2}$

$-2x^2 + 4x + 6 = 0 \to x^2 - 2x - 3 = 0 \to (x-3)(x+1) = 0 \to x = 3$, $x = -1$

$\boxed{k = 3}$

(۹)



$6 = a(x-2)^2 + 6 \to$

$4a + 6 = 4 \to 4a = -2 \to a = -\frac{1}{2}$

$-\frac{1}{2}(x^2 - 4x + 4) + 6 \to -\frac{1}{2}x^2 + 2x + 4 \to -x^2 + 4x + 8$

$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = \frac{4}{-8} = \boxed{-\frac{1}{2}}$

(۱۰)

$x^2 - (4a+4)x + (3a^2 + 6a + 3) = 0$ $\quad a = 1 \to x^2 - 8x + 12 = 0$

$4a + 4 = 2 + \beta$ $\quad (x-2)(x-6) = 0 \to x = 2$, $x = 6$

$3a^2 + 6a + 3 = 2\beta$

$3a^2 + 6a + 3 = 8a + 4$ $\quad a = -\frac{1}{3} \to x^2 - \frac{8}{3}x + \frac{4}{3} = 0$

$3a^2 - 2a - 1 = 0 \to a = 1, -\frac{1}{3}$ $\quad 3x^2 - 8x + 4 = 0 \to x = 2, \frac{2}{3}$

$\boxed{x = 6, \frac{2}{3}}$