نیایش شاه نظری — یازدهم دهتری (۱۹) — تکلیف ۱۳

$y=(a-1)x^2+x+2$ ①

$x_0=2 \rightarrow \frac{-b}{2a}=2 \rightarrow \frac{-1}{2(a-1)}=2 \rightarrow 4(a-1)=-1$ ②

$a-1=\frac{-1}{4} \rightarrow a=\frac{3}{4}$

$y=\frac{-1}{4}x^2+x+2 \rightarrow \Delta=b^2-4ac=1-4\left(\frac{-1}{4}\times 2\right)=4$

$x=\frac{-b\pm\sqrt{\Delta}}{2a}=\frac{-1\pm 2}{\frac{-1}{2}} \rightarrow \begin{cases} x=+9 \\ x=-4 \end{cases}$

$f(x)=mx^2-5x+m$ ③

x		x_1		x_2	
$f(x)$	$-$	0	$+$	0	$-$

① $m<0$

② $\Delta>0 \rightarrow 25-4m^2>0 \rightarrow 4m^2<25$

$m^2<\frac{25}{4} \rightarrow -\frac{5}{2}<m<\frac{5}{2}$

$\rightarrow -\frac{5}{2}<m<0$

۱۴

$y = x^2 - Sx + P$ $\quad S = \frac{2-\sqrt{5}}{2} + \frac{2+\sqrt{5}}{2} = 2$ ۱

$P = \left(\frac{2-\sqrt{5}}{2}\right)\left(\frac{2+\sqrt{5}}{2}\right) = \frac{4}{9}$ ۲

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

۱۵

$2x^2 - 8x + m + 2 = 0 \quad \alpha < \beta$

$2\alpha^2 + \beta^2 = 12$ ۱

$\alpha^2 + \beta^2 = S^2 - 2P = 16 - 2\left(\frac{m+2}{2}\right) = 14 - m$ ۲

$2\alpha^2 = 12 - 14 + m = m - 2 \rightarrow 2\alpha^2 = 8\alpha - m - 2$ ۳

$m - 2 = 8\alpha - m - 2$

$\alpha = \frac{m}{4} \quad \beta = 4 - \frac{m}{4} = \frac{16-m}{4}$

$P = \frac{m+2}{2} = \left(\frac{m}{4}\right)\left(\frac{16-m}{4}\right) \rightarrow -m^2 + 16m = 8(m+2)$

$-m^2 + 8m - 16 = 0$

$m^2 - 8m + 16 = 0 \rightarrow \boxed{m = 4}$

۱۶

$y = ax^2 + bx + c \quad c = 5$

$S(2,9) \rightarrow \frac{-b}{2a} = 2 \rightarrow b = -4a$ ۱

$4a + 2b + c = 9 \rightarrow 4a + 2b = 4$ ۲

$-4a = 4 \rightarrow \boxed{a = -1}$

$\boxed{b = 4}$

$\boxed{c = 5}$

$y = -x^2 + 4x + 5$

$y = -(x-5)(x+1)$

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

$\boxed{x \in (-1, 5)}$

$ax^2 - 7x + 9\beta = 0 \quad \beta > 0 \quad \alpha\beta = \frac{9\beta}{a} \rightarrow a^2 = 9$ ④

$\frac{1}{\alpha} + \frac{1}{\beta} = ?$

$\alpha + \beta = \frac{7}{a} \rightarrow \frac{\alpha^2}{9} + \alpha\beta = 7$ ③

$\alpha\beta = -2$

$\alpha^2 = 9 \rightarrow \alpha = 3 \rightarrow \beta = \frac{-2}{3}$ ✗

$\alpha = -3 \rightarrow \beta = \frac{2}{3}$

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

$x^2 + mx - 2m = 0 \rightarrow \alpha^2 = -m\alpha + 2m$ ⑦

$\alpha^2 - m\beta = 4 \rightarrow -m\alpha - m\beta + 2m = -4$

$\alpha + \beta = ? \qquad -m(\alpha+\beta) = 4 - 2m$ ③

$\frac{-b}{a} = -m \rightarrow m^2 + 2m - 4 = 0$

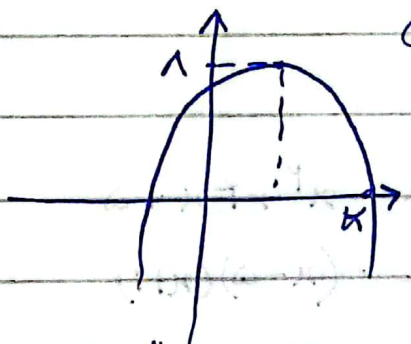
$(m+5)(m-1) = 0$

$m = -5 \rightarrow x^2 - 5x + 4 = 0 \rightarrow \Delta < 0$ ✗

$m = 1 \rightarrow x^2 + 2x - 3 = 0$ ①

$m = 1 \rightarrow \alpha + \beta = -m \rightarrow \boxed{\alpha + \beta = -1}$

$f(x) = mx^2 + 2x + \frac{m}{2} + 7$ ⑧



③

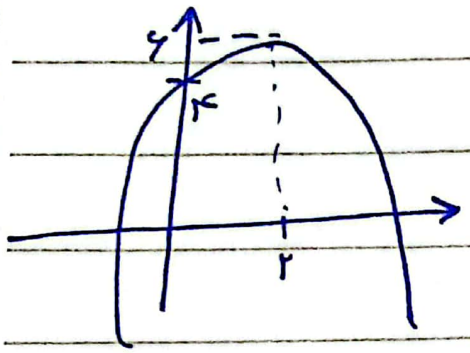
$\frac{-b}{2a} = \frac{-2}{2m} = \frac{-1}{m}$

$\left(\frac{-1}{m}\right)^2 \times m - \frac{4}{m} + \frac{m}{2} + 7 = 4$

$\frac{1}{m} - \frac{4}{m} + \frac{m}{2} = 1 \rightarrow \left(\frac{m}{2} - \frac{3}{m} = 1\right) \times m \rightarrow \frac{1}{2}m^2 - m - 3 = 0$

تاریخ: / / موضوع:

$m^2 - 2m - 8 = 0$ ↗ $m=4 \to 4n^2+4n+9 \to \Delta < 0$ ✗
↘ $m=-2 \to -4n^2+4n+4=0 \to n=1$
↘ $n=k=1^{\mu}$



⑨ $y = a(x-x_0)^2 + y_0$

$y = a(x-2)^2 + 4$

ج) $x=0 \to y = 4a+4 = 0$

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

$y = \frac{-1}{2}(x^2-4x+4)+4$

$y = \frac{-1}{2}x^2 + 2x + 2$

$\frac{1}{x_1} + \frac{1}{x_2} = \frac{x_1+x_2}{x_1 x_2} = \frac{\frac{-2}{-\frac{1}{2}}}{} = ⑭ \to \frac{1}{\alpha_1} + \frac{1}{\alpha_2} = \boxed{\frac{-1}{2}}$

$\frac{4}{\frac{-1}{2}} = -8$

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⑩ $x^2 - (2a+2)x + (2a^2+6a+2) = 0$ $\quad a+1 = m$

$x^2 - 2mx + m^2 = 0$

$x=2 \to 4 - 8m + 4m^2 = 0$

$4m^2 - 8m + 4 = 0 \to m = \frac{2}{4} \to x^2 - \frac{8}{4}x + \frac{4}{4} = 0$

$\to m = 2 \to x^2 - 8x + 12 = 0$

$\to x=2$

$\to \boxed{x=6}$

ج) $x=2 \to \boxed{x = \frac{2}{4}}$

$4x^2 - 8x + 4 = 0$