تکلیف ۱۳

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آکنیا کریمی یازدهم دفتر B Page: ( )

(۱)

$y=(a-1)x^2+x+3$

$\frac{-b}{2a}=2=\frac{1}{2-2a} \Rightarrow 4-4a=1 \quad 4a=3 \Rightarrow a=\frac{3}{4}$

$y=\frac{-x^2}{4}+x+3 \to \frac{-x^2}{4}+x+3=0=-x^2+4x+12$

$-(x-6)(x+2)=0 \longrightarrow \underline{x=6}$

(۲)

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

	x_1		x_2	
$-$	0	$+$	0	$-$

$m<0$ (I)

$\Delta>0 \longrightarrow 25-4m^2>0 \quad 4m^2<25 \quad m^2<\frac{25}{4} \to -\frac{5}{2}<m<\frac{5}{2}$ (II)

$\underline{I\cap II} \Rightarrow -\frac{5}{2}<m<\frac{5}{2}$

(۳)

$S=\frac{3-\sqrt5}{3}+\frac{3+\sqrt5}{3}=\frac{6}{3}=2$

$P=\frac{3-\sqrt5}{3}\times\frac{3+\sqrt5}{3}=\frac{9-5}{9}=\frac{4}{9}$

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

(۴)

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

$3\alpha^2+\beta^2=12$

$P=\alpha\beta=\frac{2+m}{2}$

$S=\frac{-(-8)}{2}=4 \to \beta=4-\alpha \to \beta^2=(4-\alpha)^2$

$\Rightarrow \alpha+\beta=4 \Rightarrow \beta=3$

$3\alpha^2+(4-\alpha)^2=3\alpha^2+16+\alpha^2-8\alpha=12 \Rightarrow 4\alpha^2-8\alpha+16=12 \Rightarrow 4\alpha^2-8\alpha+4=0 \quad 4(\alpha-1)^2=0 \Rightarrow \underline{\alpha=1}$

$\frac{m+2}{2}=\alpha\beta \to m+2=6 \Rightarrow \underline{m=4}$

(۵)

$y=a(x-h)^2+k \Rightarrow 5=a(0-2)^2+9$

$4a+9=5 \quad 4a=-4 \Rightarrow \underline{a=-1}$

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

$y=-x^2+4x-4+9=-x^2+4x+5$

$5x$ بالای محور $\to (-1,5)$

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$\rightarrow \beta > 0$

$\alpha x^2 - 7x + 9\beta = 0 \qquad \frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha+\beta}{\alpha\beta} = ?$ (6)

$S = \frac{7}{\alpha} \quad P = \frac{9\beta}{\alpha} = \alpha \times \beta \rightarrow \alpha = \frac{9}{\alpha} \rightarrow \alpha^2 = 9 \Rightarrow \alpha = \pm 3$

$\alpha = 3 \rightarrow 3 \times 9 - 21 + 9\beta = 0 \quad \beta = -\frac{2}{3}$ غ ق ق $\quad \beta > 0$

$\alpha = -3 \rightarrow -27 + 21 + 9\beta = 0 \quad 9\beta = 6 \quad \beta = \frac{6}{9} = \frac{2}{3}$ ✓

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

$x^2 + mx - 2m = 0 \qquad \alpha^2 - m\beta = 8$ (7)

$\Rightarrow \alpha^2 = 2m - m\alpha$

$2m - m\alpha - m\beta = 8 \qquad 2m - m(\overbrace{\alpha+\beta}^{-m}) = 8$

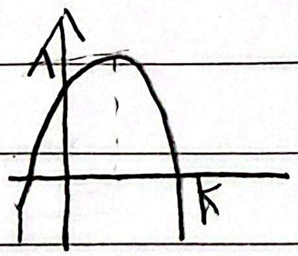
$\rightarrow 2m + m^2 - 8 = 0 \Rightarrow m^2 + 2m - 8 = 0 \rightarrow (m+4)(m-2) = 0$

$\Rightarrow m = -4 , m = 2$

$m = -4 \rightarrow x^2 - 4x + 8 = 0 \quad \Delta = 16 - 32 < 0$ ✗

$m = 2 \rightarrow x^2 + 2x - 4 = 0 \quad 4 + 16 > 0$ ✓

$S = -m \rightarrow x^2 + 2x - 4 \rightarrow \boxed{S = -2}$



$f(x) = mx^2 + 4x + \frac{m}{2} + 7$ (8)

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

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

$m \times \frac{4}{m^2} - \frac{8}{m} + \frac{m}{2} + \underbrace{7 - 8}_{-1} =$

$\frac{-4}{m} + \frac{m}{2} + 7 = 0 \qquad -8 + m^2 - 2m = 0$

$m^2 - 2m - 8 = 0 \quad (m-4)(m+2) = 0 \xrightarrow{a<0} \boxed{m = -2}$

$\rightarrow -2x^2 + 4x + 6 = 0 \rightarrow -(x-3)(x+1) \rightarrow \boxed{x = 3} \quad x = -1$

$\Rightarrow \boxed{K = 3}$

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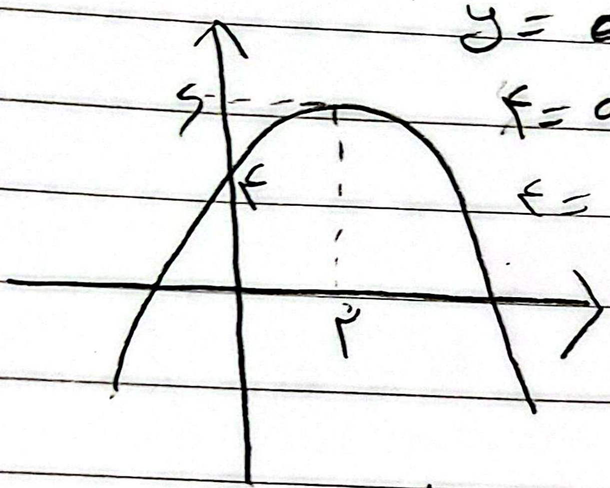

$y = a(x-h)^2 + k$

$4 = a(0-2)^2 + 6$

$4 = 4a + 6 \qquad 4a = -2$

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

$y = \frac{-1}{2}(x-2)^2 + 6 = \frac{-x^2}{2} + 2x + 4$

$\frac{-b}{2a} = \frac{-2}{\frac{-1}{2}} = 4 \qquad P = \frac{4}{\frac{-1}{2}} = 8$

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

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$x^2 - (4a+4)x + (3a^2+6a+3) = 0$

$\rightarrow 4 - 8a - 8 + 3a^2 + 6a + 3 = 3a^2 - 2a + 1 = 0$

$a^2 - 2a - 3 = 0 \Rightarrow (a-3)(a+1) = 0 \begin{cases} a = +1 \\ a = \frac{-1}{3} \end{cases}$

$\xrightarrow{a=1} x^2 - 8x + 12 = 0 \rightarrow \Delta = 64 - 48 = 16$

$\frac{8 \pm 4}{2} \qquad x \begin{cases} 6 \\ 2 \end{cases}$

$\xrightarrow{a=\frac{-1}{3}} x^2 - \frac{8x}{3} + \frac{4}{3} = 0 \rightarrow \Delta = \frac{16}{9}$

$\frac{\frac{8}{3} \pm \frac{4}{3}}{2} \Rightarrow x = \frac{2}{3}, 2$

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