زینب ماهی کلاس A تالیف شماره ۲۳

سوال 1

$x_S = -1$
$y_S = 9$

$y = a(x-1)(x-3)$

$\begin{cases} 1 = 9a + 3b + c \\ 9 = a - b + c \end{cases}$

$-8 = 8a + 4b$
$-2 = 2a + b$
$\rightarrow 2a = -2 - b \rightarrow \frac{-b}{2a} = \frac{-b}{-2-b} = -1$

$\frac{b}{2+b} = -1 \rightarrow b = -1 \rightarrow a = -\frac{1}{2} \rightarrow c = 8/5 \Rightarrow y = -\frac{x^2}{2} - x + \frac{17}{2}$

$\Delta > 0 \rightarrow b^2 - 4ac, \; m^2 - 4(2)(m+4) = m^2 - 8m - 48 = (m-12)(m+4)$ ④

$\frac{-4 \quad 12}{+ \; \phi \; - \; \phi \; +} \rightarrow m > 12, \; m < -4 \rightarrow (-\infty, -4) \cup (12, +\infty)$

$S > 0 \rightarrow -\frac{b}{a} > 0 \rightarrow -\frac{m}{2} > 0 \rightarrow \frac{m}{2} < 0 \quad m < 2, \; P > 0 \rightarrow \frac{m+4}{2} > 0$
$m = (-4, 4) \quad m > -4$

$S = \frac{1}{P} \rightarrow -\frac{b}{a} = \frac{9}{c} = a^2 = -bc \rightarrow 9 = -(3m-1)(2-m) =$ ③

$3m^2 - 5m + 2 - 9 = 2m^2 - 5m - 7 \xrightarrow{\text{حل}} m^2 - 5m - 14 = 0 \; (m-7)(m+2)$

$m = \frac{7}{2}, \; m = -1 \rightarrow \Delta > 0 \rightarrow m = -1 \; 3m^2 - 3m + 1 = 0$

$\Delta = 9 - (4 \times 3 \times 1) \quad m = 3/5 \rightarrow 3x^2 - 4x - 1/5 = 0 \rightarrow \Delta = 36 + (4 \times 1/5)$

$m = 5/3$

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$$\left(\sqrt[3]{x^2}+\frac{1}{\sqrt[3]{x^2}}+1\right)\left(\sqrt[3]{x^2}-1\right)\xrightarrow{\times\sqrt[3]{x^2}}\left(\sqrt[3]{x^4}+1+\sqrt[3]{x^2}\right)\left(\sqrt[3]{x^2}-1\right)$$ -۵

$x^2-1=2x \Rightarrow x^2-2x-1=0 \to P=-1,\ S=2$

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$\alpha+\beta=\frac{-(-a)}{3}=\frac{a}{3}\ ,\ \alpha.\beta=\frac{2}{3}$

$\alpha(3\alpha)=3\alpha^2=\frac{2}{3}\to\alpha=\pm\frac{2}{3}\Rightarrow a=3(\alpha+\beta)=3(\alpha+3\alpha)=12\alpha$

$\Rightarrow a_1=8\ ,\ a_2=-8$ اختلاف دو $=16$ $\quad a=\frac{2}{3}$ ... $=-8$

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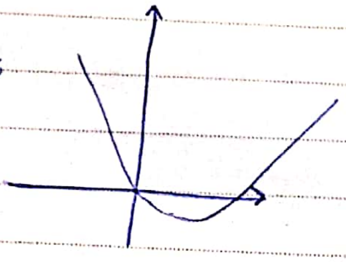
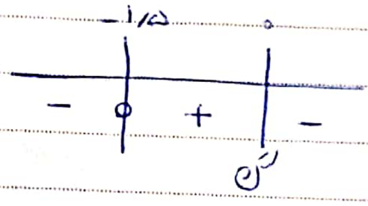
$a>0$ ← چون عرض از مبدأ صفره



$-\frac{b}{a}=\frac{-3-2a}{a}>0$



$-\frac{3}{2}<a<0$

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$y=x^2+ax-2 \to$ محور تقارن $\Rightarrow x=-\frac{a}{2}$

$y=-x^2-2x+b \to$ " " $\Rightarrow x=-1$

$\Big\}\ -\frac{a}{2}=-1\Rightarrow a=2$

$m^2+2m-2=1\Rightarrow m^2+2m-3=0\to m=1\ ,\ -3$

نقطه (۱،۱) یعنی روی $y=-x^2-2x+b$ قرار دارد $b=4$ $\quad$ یعنی نقطه (۱،۳-) هم $b=4$

$a.b=2\times4=8$

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$2x^2-ax+b=0\ ,\ 2ax^2+ax-6=0$

$S=\frac{a}{2}$ $\quad S'=S+1=-\frac{a}{2a}$

$2x^2-x+b=0\ ,\ 2x^2+x-6=0$

ریشه ها $\Rightarrow (2x+\frac{4}{2})(2x-\frac{3}{2})=0\to x_1=-2$

$x_2=1/5$

$x_1x_2=-3$

$-3=\frac{b}{2}\quad b=-6$

$\left[\frac{-6\times1}{4}\right]=\left[-\frac{3}{2}\right]=-2$

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$$\begin{cases} a^2+4a+m=0 \\ a^2+2a-3m=0 \end{cases} \Big\} (a^2+4a+m)-(a^2-2a-3m)=0$$

$$2a+3m=0 \longrightarrow m=-a$$

$$a^2+4a+m=0 \Rightarrow a^2+4a-a=0 \rightarrow a^2+3a=0 \Rightarrow \begin{cases} a=0 \ \text{ق} \\ a=-3 \ \checkmark \end{cases}$$

$$x^2+4x+m=0 \longrightarrow x^2+4x+3=0 \Rightarrow (x+1)(x+3)=0$$

$$x^2+2x-3m=0 \Rightarrow x^2+2x-15=0 \Rightarrow (x-3)(x+5)$$

$$1--3=4$$

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$$x_1+x_2=S=1 \qquad x_1 x_2=P=-4$$

$$S's \quad x_1^3+\frac{1}{x_2^3}+x_2^3+\frac{1}{x_1^3}=(S^3-3SP)+\frac{x_1+x_2}{x_1x_2}$$

$$=1+12+\frac{1}{4}=\frac{61}{4} \rightarrow P'\left(x_1^3+\frac{1}{x_2^3}\right)\left(x_2^3+\frac{1}{x_1^3}\right)=(x_1x_2)^3$$

$$+x_1^3\left(\frac{1}{x_1^3}\right)+\left(\frac{1}{x_2^3}x_2^3\right)+\frac{1}{x_1x_2}=\underbrace{(x_1x_2)^3}_{-64}+\underbrace{x_1^3x_2^3}_{1}+\underbrace{\frac{1}{x_1x_2}}_{-\frac{1}{4}}$$

$$=\frac{-221}{4} \longrightarrow x'^2-\left(\frac{61}{4}\right)x'+\left(\frac{-221}{4}\right)=0$$

$$(x')^2-\frac{61}{4}x'-\frac{221}{4}=0$$

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