۲۵ پارسا اکبر نهم ۵ بهمن چهارشنبه ۱۵

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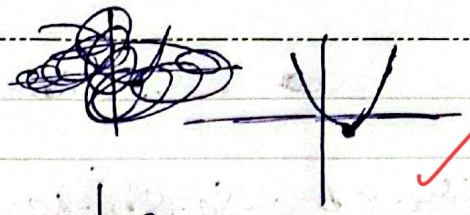
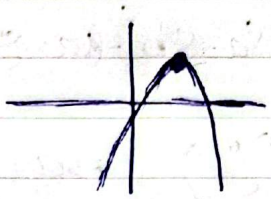
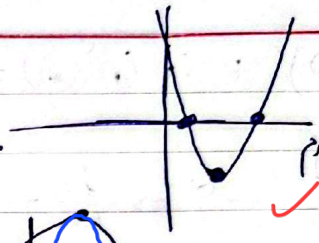
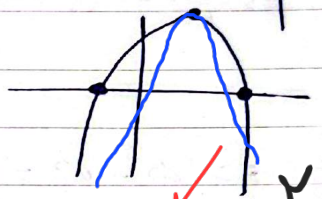
۱- الف) $\min \left| \frac{1}{2} \right| = \frac{1}{2}$ ⇒  ناحیه ۳ ✓

ب) $\max \left| \frac{2}{3} \right|$ ⇒  ناحیه ۲ ✓ (۲)

۲- الف) $\frac{-b \pm \sqrt{\Delta}}{2a} = \frac{3 \pm \sqrt{9}}{8} < \frac{1}{2}$ $a > 0$ ⇒  نواحی اول، دوم و چهارم ✓ (۲)

ب) $\frac{-4 \pm \sqrt{16}}{-4} < \begin{matrix} \alpha \Rightarrow \alpha < 0 \\ \beta \Rightarrow \beta > 0 \end{matrix} \Rightarrow$  ✓

$a < 0$

همه نواحی به جز ناحیه ۲

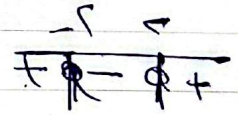
۳- الف) $\frac{\alpha+\beta}{\alpha+\beta} = \frac{5}{\frac{\sqrt{\Delta}}{|a|}} \Rightarrow \frac{\frac{-b}{a}}{\frac{\sqrt{\Delta}}{|a|}} = \frac{1}{\sqrt{12}} = \frac{\sqrt{12}}{12}$ ✓

ب) $S^2 - 2P = 1 - (2)(-3) = 7$ ✓

ج) $S^3 - 3SP = 1 - (3)(1)(-3) = 10$ ✓ (۲)

د) $(\alpha-\beta)(\alpha^2+\alpha\beta+\beta^2) \Rightarrow (\sqrt{12})(7+(-3)) = 4\sqrt{12}$ ✓

۴- $k=2$ ، $x^2 - ax + a \Rightarrow \Delta < 0$ (۱/۵)

$\Rightarrow a^2 - 4 < 0 \Rightarrow (a-2)(a+2) < 0 \Rightarrow$  $\Rightarrow (-2, 2)$

۱) $ax^2 - ax + a \rightarrow$ ۲ عضو ریشه $\rightarrow (x-1)^2 = x^2 - 4x + 4$ ، $a=4$ (I)

۲) $ax^2 - ax + a \rightarrow$ ریشه ندارد $\rightarrow \Delta < 0 \rightarrow a^2 - 4a < 0 \rightarrow 0 < a < 4$ (II)

} $\rightarrow 0 \le a < 4$

۵- $\alpha^2 + \beta^2 + \alpha^2 - 4\alpha = 7 \Rightarrow S^2 - 2P + \alpha(\alpha - 4) = 7$ (۱/۵)

$\Rightarrow 16 + (5 \times \frac{a}{2}) = 7 \Rightarrow a = -9 \Rightarrow \alpha = 1$ $\frac{\alpha}{\beta} = -\frac{9}{6}$

$\beta = 6$

$\alpha + \beta = -\frac{-12}{3} = 4 \rightarrow \beta = 4 - \alpha$ (I)

$2\alpha^2 + \beta^2 - 4\alpha = 7 \xrightarrow{(I)} 2\alpha^2 + (4-\alpha)^2 - 4\alpha = 7 \rightarrow 3\alpha^2 - 12\alpha + 9 = 0 \rightarrow \begin{cases} \alpha = 1 \\ \alpha = 3 \end{cases} \rightarrow a = -9$

$\frac{a}{\alpha_{max}} = \frac{-9}{3} = -3$

سوالات ۶ و ۸ را جایی بنویسم.

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۶- $2x+3y+a=0 \Rightarrow y=-\frac{2}{3}x-\frac{a}{3}$, $3x-2y=b \Rightarrow y=\frac{3}{2}x-\frac{b}{2}$

$\Rightarrow -\frac{2}{3}=-\frac{1}{c} \Rightarrow b^2-4ac=-\frac{1}{c}$, $3a-2b=a+b$

$\Rightarrow 4a-6b=0 \Rightarrow 2a=3b \Rightarrow a=\frac{3}{2}b \Rightarrow \frac{9}{4}a=b^2-4a\times\frac{a}{b} \Rightarrow \frac{9}{4}a=b^2-\frac{4a^2}{b}$ (۲)

$\Rightarrow 4b^2-4b=0 \Rightarrow 4b(b-1)=0 \Leftarrow \begin{cases} b=0 & \times \\ b=1 & \checkmark \end{cases}$ $\Rightarrow a=\frac{1}{2} \Rightarrow \frac{1}{4}x^2+2x+\frac{9}{4}=0$

$\Rightarrow \frac{1}{4}+2+\frac{9}{4}=6$ ✓

۷- $20(\alpha^2-2\beta)+10(\beta^2-\beta)=14 \Rightarrow 20+40\frac{b}{a}+10\frac{b}{a}=14$

$\Rightarrow 50\frac{b}{a}=-6 \Rightarrow \frac{b}{a}=-\frac{1}{10} \longrightarrow -20x^2+10x+1=0$ (۲)

تفاضل $=\frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{40}}{20}=\frac{\sqrt{10}}{5}$ ✓

$a(\beta^2-\beta)=b \Rightarrow \beta^2-\beta=\frac{b}{a}$

۸- سهمی‌ها دارای $b=\frac{2a+2+7-2a}{2}=4 \Rightarrow S(4,2)$ (۱)

$\Rightarrow a(x-4)^2+2=y \Rightarrow a(19)+2=0 \Rightarrow a=-\frac{1}{19} \Rightarrow$ محور تقارن دو سهمی

$\Rightarrow \frac{8}{19}+2$

$7-2a>0 \rightarrow a<\frac{7}{2}$
$2a+3>0 \rightarrow a>-\frac{3}{2}$
$a-2>0 \rightarrow a>2$
} اشتراک $\rightarrow a=2 \rightarrow A(4,1), B(1,1)$

$(y-2)=a(x-4)^2 \xrightarrow{(1,1)} (1-2)=a(1-4)^2 \rightarrow a=-\frac{1}{8} \rightarrow (y-2)=-\frac{1}{8}(x-4)^2$

$x=0 \rightarrow (y-2)=-\frac{1}{8}(0-4)^2 \rightarrow y=2-\frac{16}{8} \rightarrow y=\frac{1}{8}$ ⇝ طول $=\frac{1}{8}$

۹- $2x^2+4x+a=0 \rightarrow \begin{cases} S=\frac{-b}{a}=-4 \\ P=\frac{c}{a}=a \end{cases}$ $|\alpha-\beta|=\frac{\sqrt{\Delta}}{|a|}=\sqrt{24-8a}$ $\alpha^2+\beta \rightarrow \alpha-\beta=10$

۱۰- $\alpha^3+\beta^3=112\sqrt{2}+88 \rightarrow \frac{3}{4}(\alpha^2+\beta^2)+\frac{1}{4}(\alpha^3-\beta^3)=112\sqrt{2}+88 \rightarrow \frac{3}{4}(S^2-2P)+\frac{1}{4}(\alpha+\beta)(\alpha-\beta)=112\sqrt{2}+88$

$\rightarrow \frac{3}{4}(S^2-2P)-\frac{1}{4}S\sqrt{24-8a} \rightarrow \frac{3}{4}(16-8a)-\frac{1}{4}(-4)\sqrt{24-8a}=112\sqrt{2}+88 \rightarrow 48-6a+3\sqrt{24-8a}=112\sqrt{2}+88$

$\begin{cases} 48-6a=88 \rightarrow a=1 \\ 3\sqrt{24-8a}=112\sqrt{2} \rightarrow 24-8a=32 \rightarrow a=1 \end{cases}$

۱۰- $\frac{1}{\sqrt{\alpha}}+\frac{1}{\sqrt{\beta}}=3 \Rightarrow \frac{\sqrt{\alpha}+\sqrt{\beta}}{\sqrt{\alpha\beta}}=3 \Rightarrow 3\sqrt{\alpha\beta}=\sqrt{\alpha}+\sqrt{\beta}$

$\Rightarrow \alpha+\beta+2\sqrt{\alpha\beta} \Rightarrow \frac{5m}{25}=\frac{m+14}{25}+\frac{2}{5} \Rightarrow m=-1$ (۲)

$\Rightarrow -x^2+5x+2=0 \Rightarrow \alpha.\beta=\frac{c}{a}=-2$ ✓