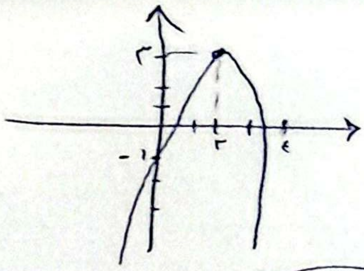
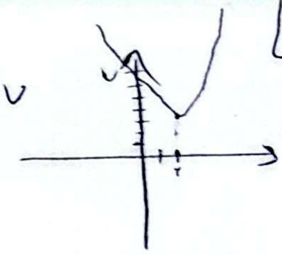
مهدی کاظمی

۱- $y=-x^2+4x-1$



$y=x^2-4x+7$



۲- الف) $2x^2+(m+1)x+\frac{1}{2}m+2=0$

$m^2+1+2m-4(m+4)=m^2+1+2m-4m-16$

$m^2-2m-15>0 \quad (m+3)(m-5)>0$

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$+$	$-$		$+$

$m \Rightarrow (-\infty,-3)\cup(5,+\infty)$

ب) $m=5,-3$

ج) $m \Rightarrow (-3,5)$

$m \Rightarrow (-\infty,-3]\cup[5,+\infty)$

۳- الف) $a=m-2<0 \longrightarrow m<2$

$\Delta=(m+1)^2-4(m-2)(10)=m^2-38m+81>0$

$m<2 \quad \checkmark \Delta>0$

ب) $\frac{m+1}{2m-4}=2$

$m+1=2(2m-4)$

$m+1=4m-8 \rightarrow m=3$

۵- $\Delta=(-2\sin\alpha)^2-4(\frac{2}{3})(\frac{3}{2})=0 \quad 4\sin^2\alpha-4=0 \rightarrow \sin^2\alpha=1 \rightarrow \sin\alpha=\pm1$

$x=\frac{2}{\frac{4}{3}}=\frac{2\times3}{2\times4}=\frac{3}{2}\ \checkmark \quad x=\frac{-2}{2(\frac{2}{3})}=-\frac{3}{2}$ ✗

$3x^2-2x-1 \Rightarrow (3x+1)(x-1) \quad 1-x^2=-(x^2-1)=-(x-1)(x+1)$

۶- $y=\frac{((3x+1)(x-1))((3x-5)(x+1))}{-(x-1)(x+1)} \longrightarrow y=(3x+1)(3x-5) \quad y_{max}=9$

۷- $S=\frac{m+2}{m} \quad P=\frac{-2}{m} \rightarrow 3S=5P+7 \rightarrow 3(\frac{m+2}{m})=5(\frac{-2}{m})+7 \rightarrow 3m+6=-10+7m$

$16=4m \rightarrow m=4$

$S=\frac{3}{2},\ P=-\frac{1}{2} \longrightarrow x_1^2+x_2^2=(\frac{3}{2})^2-2(-\frac{1}{2}) \longrightarrow x_1^2+x_2^2=\frac{13}{4}$

۸- $\alpha^3+\beta^3=(\alpha+\beta)^3-3\alpha\beta(\alpha+\beta)=S^3-3PS \longrightarrow 5^3-3\times2\times5=125-30=95$

$\frac{\alpha^3+\beta^3}{\alpha\times\beta}=\frac{95}{10}=9.5$

۹- $ax^2+(b-2)x-8=0 \longrightarrow 2\times3=\frac{8}{a} \rightarrow 6a=8 \rightarrow a=\frac{8}{6}=\frac{4}{3}$

$b=2-5(-\frac{4}{3})=\frac{26}{3} \quad x=\frac{-b}{2a}=\frac{13}{4}$

۱۰- $m^2-14m-35=0 \longrightarrow m=7\pm2\sqrt{21}$

$x=\frac{-m-1}{2}>0 \quad m<-1$

$m=7-2\sqrt{21}$