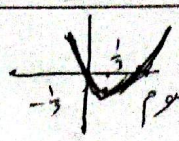
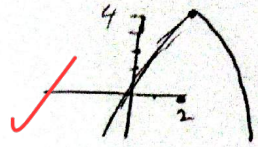
14,5

نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

الف) $\min\left|\begin{matrix}\frac{1}{3}\\ -\frac{1}{3}\end{matrix}\right.$  سهم ✓

۲) $\max\left|\begin{matrix}2\\ 4\end{matrix}\right.$  ✓ ۲

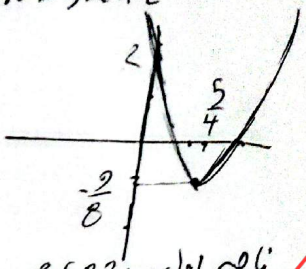
۲

الف) $2x^2-5x+2$

$ext\left|\begin{matrix}-\frac{b}{2a}=\frac{5}{4}\\ -\frac{\Delta}{4a}=-\frac{9}{8}\end{matrix}\right.$

$\Delta=25-16=9$

$c=2$



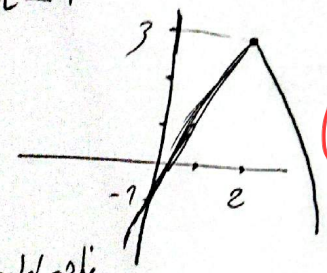
ناحیه اول و سوم و چهارم ✓

۲) $-x^2+4x-1$

$ext\left|\begin{matrix}-\frac{b}{2a}=2\\ -\frac{\Delta}{4a}=-\frac{12}{4}=3\end{matrix}\right.$

$\Delta=16-4=12$

$c=-1$ ✓



ناحیه اول و سوم و چهارم ✓ ۲

۳

الف) $\frac{\alpha+\beta}{\alpha\beta}=\frac{-\frac{b}{a}}{\frac{c}{a}}=\frac{1}{-3}=\frac{\sqrt{13}}{13}$ ✓

$x^2-x-3=0$

$\Delta=1-(-12)=13$

$P=-3$

۲) $\alpha^2+\beta^2=S^2-2P=1-2(-6)=13$ ✓

۳) $\alpha^3+\beta^3=S^3-3SP=1+9=10$ ✓

۴) $\alpha^3-\beta^3=(\alpha-\beta)^3+3P(\alpha-\beta)=(\sqrt{13})^3-3\sqrt{13}=\frac{39\sqrt{13}}{13}-9\sqrt{13}$ ✓ ۲

۴

$y=0 \Rightarrow x-2=0 \Rightarrow x=2$ ✓

$\Delta=0 \Rightarrow x^2-4x+4=0 \Rightarrow x=2$ ✓ ۱

۲) $\Delta=0 \Rightarrow a^2-4a=0 \Rightarrow a=4$

۱) ax^2-ax+a → ۲ ریشه مضاعف → $(x-4)^2=x^2-8x+16$, $a=4$ (I) → $a\neq 4$

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

۵

$\alpha^2+\beta^2+\alpha^2-4\alpha=7$

$S^2-2P+\alpha(\alpha-4)=7 \Rightarrow 16+3\alpha(\alpha-4)=7 \Rightarrow 3\alpha^2-12\alpha+9=0 \Rightarrow \alpha=1,3$

$S=4, P=3 \Rightarrow \alpha=1,\beta=3$

$\alpha+\beta=4 \Rightarrow \alpha-4=\beta$ (I)

$\frac{\alpha}{\beta}=\frac{1}{3}$

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

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

1,0

$S=\alpha+\beta=1 \rightarrow \alpha=1-\beta$

$$\begin{cases} a\alpha^2-a\alpha-b=0 \\ a\beta^2-a\beta-b=0 \end{cases}$$

$$20(S^2-2P)+20(\beta^2-P)=17$$

$$20+40\frac{b}{a}+20\frac{b^2}{a^2}=17 \Rightarrow 60\frac{b}{a}=-3 \Rightarrow \frac{b}{a}=\frac{-1}{20} \Rightarrow -20\alpha^2+20\alpha+1=0$$

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

$$\rightarrow \beta=\frac{20\pm\sqrt{480-80}}{40}=\frac{10\pm\sqrt{80}}{20}$$

$$D=\frac{\sqrt{\Delta}}{|a|}=\frac{\sqrt{320}}{20}=\frac{\sqrt{20}}{5}$$

$$\alpha-\beta=1-\beta-\beta=1-2\beta \rightarrow 1-2\left(\frac{10\pm\sqrt{80}}{20}\right)=\pm\frac{2}{\sqrt{5}} \rightsquigarrow \text{اصلاحی}=\frac{2}{\sqrt{5}}$$

(۱)

$$\text{تقارن} \Rightarrow b=\frac{2a+3+7-2a}{2}=5 \rightarrow S(5,3) \Rightarrow a(x-5)^2+3=y$$

$$\Rightarrow a(19)^2+3=7 \Rightarrow a=\frac{1}{19} \Rightarrow a=0 \Rightarrow \frac{25}{19}+3$$

(۱)

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

$$\begin{cases} b-2a>0 \rightarrow a<\frac{b}{2} \\ 4a+2>0 \rightarrow a>-\frac{1}{2} \\ a-2>0 \rightarrow a>2 \end{cases} \xrightarrow{\text{اشتراک}} a=2 \rightarrow A(4,1), B(1,1)$$

$$x=0 \rightarrow (y-2)=\frac{1}{4}(0-2)^2 \rightarrow y=2-\frac{4}{4} \rightarrow y=\frac{1}{4} \rightsquigarrow \text{مطلوب}=\frac{1}{4}$$

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

(۷)

$$-\frac{b}{4a}=-\frac{1}{2} \Rightarrow \frac{b^2-4ac}{-4a}=-\frac{1}{2} \text{ و } 25a-5b=a+b \Rightarrow 24a-6b=0 \Rightarrow$$

$$24a=6b \Rightarrow 4a=2b^2-(8a\times\frac{3}{2}) \Rightarrow \frac{4a}{b}=2b-\frac{12a}{3b}$$

$$\Rightarrow 2b^2-4b=0 \Rightarrow 2b(b-2)=0 \begin{cases} b=0 \\ b=2 \end{cases} \Rightarrow a=\frac{1}{2} \Rightarrow \frac{1}{2}x^2+2x+\frac{3}{2}=0$$

$$\Rightarrow \frac{1}{2}+2+\frac{3}{2}=4$$

(۲)

(۸)

$$\alpha\cdot\beta=a \quad \alpha+\beta=-6 \quad \alpha=-6-\beta$$

$$3\alpha^2+2\beta^2=3(-6-\beta)^2+2\beta^2=3(36+\beta^2+12\beta)+2\beta^2=5\beta^2+36\beta+108=85+72\sqrt{2}$$

$$5\beta^2+36\beta+23-72\sqrt{2}=0 \Rightarrow \beta=\frac{-36\pm\sqrt{362-20(23-72\sqrt{2})}}{10} \Rightarrow \beta=\frac{-36+(64+20\sqrt{2})}{10}$$

$$\beta<-3+2\sqrt{2} \quad \alpha=-6-\beta=-3-2\sqrt{2}$$

$$-\frac{22}{5}-2\sqrt{2}\alpha \qquad a=\alpha\beta=(-3-2\sqrt{2})(-3+2\sqrt{2})=9-8=1$$

(۲)

(۹)

$$\frac{1}{\sqrt{\alpha}}+\frac{1}{\sqrt{\beta}}=5 \Rightarrow \frac{\sqrt{\alpha}+\sqrt{\beta}}{\sqrt{\alpha\beta}}=5 \Rightarrow 5\sqrt{\alpha\beta}=\sqrt{\alpha}+\sqrt{\beta} \Rightarrow \alpha+\beta+2\sqrt{\alpha\beta}$$

$$\Rightarrow \frac{25}{36}=\frac{m+11}{36}+\frac{2}{6} \Rightarrow m=-1 \Rightarrow 6x-2x^2+3x+2=0 \Rightarrow \alpha\beta=\frac{c}{a}=-2$$

(۲)

(۱۰)