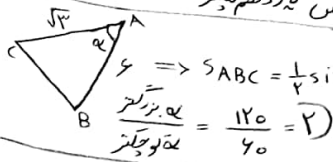
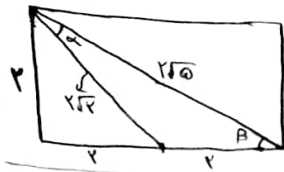
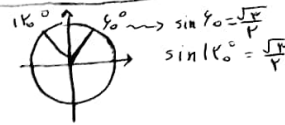


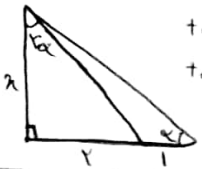
تکلیف شماره ۲۷ کلاس نهم ریاضی



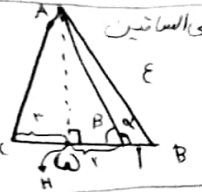
$S_{ABC} = \frac{1}{2} \sin \alpha \times r \times \sqrt{3} = \frac{1}{2} \Rightarrow \sin \alpha = \frac{1}{\sqrt{3}}$



$\sin \alpha = \frac{r}{\sqrt{10}} = \frac{1}{\sqrt{10}}$
 $\cot \alpha = \frac{r}{1} \Rightarrow \cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{\frac{\sqrt{2}}{\sqrt{10}}}{\frac{1}{\sqrt{10}}} = \sqrt{2}$
 $\frac{b}{\sin \beta} = \frac{a}{\sin \alpha} \Rightarrow \frac{\sqrt{2}}{1} = \frac{r}{\frac{1}{\sqrt{10}}} \Rightarrow \sin \alpha = \frac{1}{\sqrt{10}}$
 $\sin \alpha + \cos^2 \alpha = 1 \Rightarrow \frac{1}{\sqrt{10}} + \cos^2 \alpha = 1 \Rightarrow \cos^2 \alpha = \frac{9}{10} \Rightarrow \cos \alpha = \frac{3}{\sqrt{10}}$



$\tan \alpha = \frac{y}{x}$
 $\tan \alpha = \frac{y \tan \alpha}{1 - \tan^2 \alpha} \Rightarrow \frac{y}{x} = \frac{\frac{y^2}{x^2}}{1 - \frac{y^2}{x^2}} \Rightarrow 1 - \frac{y^2}{x^2} = \frac{y^2}{x^2} \Rightarrow 1 = \frac{2y^2}{x^2} \Rightarrow x^2 = \frac{2y^2}{1} \Rightarrow x = \frac{\sqrt{2}y}{1}$
 $\tan \alpha = \frac{y}{\frac{\sqrt{2}y}{1}} = \frac{1}{\sqrt{2}} \Rightarrow \cot \alpha = \sqrt{2}$



$AB = AC$
 $AH = \sqrt{AC^2 - CH^2} = \sqrt{r^2 - \frac{r^2}{4}} = \frac{\sqrt{3}r}{2}$

$\tan \alpha = \tan(180^\circ - \beta) = -\tan \beta = \frac{-\sqrt{3}}{1}$

$r \sin^2 \alpha + \cos^2 \alpha = \frac{1}{r} \Rightarrow 1 + \sin^2 \alpha = \frac{1}{r} \Rightarrow \sin^2 \alpha = \frac{1}{r} - 1, \cos^2 \alpha = \frac{1}{r}$
 $\tan^2 \alpha = \frac{\sin^2 \alpha}{\cos^2 \alpha} = \frac{\frac{1}{r} - 1}{\frac{1}{r}} = \frac{1-r}{1}$

$\frac{\sin^2 \alpha + \epsilon \cos^2 \alpha}{1 + \cos^2 \alpha} = \frac{\cos^2 \alpha + \epsilon \sin^2 \alpha}{1 + \sin^2 \alpha} \Rightarrow \frac{\sin^2 \alpha + \epsilon - \epsilon \sin^2 \alpha}{1 + 1 - \sin^2 \alpha} = \frac{\cos^2 \alpha + \epsilon - \epsilon \cos^2 \alpha}{1 + 1 - \cos^2 \alpha} \Rightarrow \frac{(\sin^2 \alpha - \epsilon)^2}{1 - \sin^2 \alpha} = \frac{(\epsilon - \cos^2 \alpha)^2}{1 - \cos^2 \alpha}$
 $\Rightarrow \epsilon - \sin^2 \alpha - (\epsilon - \cos^2 \alpha) \Rightarrow \epsilon - \sin^2 \alpha - \epsilon + \cos^2 \alpha \Rightarrow \cos^2 \alpha - \sin^2 \alpha = 1 - 2\epsilon \sin^2 \alpha$

$\sin(\frac{\pi}{4} + \alpha) = \sin(\frac{\pi}{4} + \alpha) = +\cos \alpha$
 $\cos(\frac{\pi}{4} - \alpha) = \cos(\frac{\pi}{4} - \alpha) = -\sin \alpha$

$\tan(\alpha - \frac{\pi}{4}) = -\cot \alpha$

 $\Rightarrow \cos \alpha = \frac{y}{r}, \sin \alpha = \frac{x}{r}, \cot \alpha = \frac{y}{x}$

$(\cos \alpha)(-\sin \alpha) - (-\cot \alpha) = (\frac{y}{r})(-\frac{x}{r}) + \frac{y}{x} = \frac{-xy}{r^2} + \frac{y}{x} = \frac{-xy + yx}{r^2} = 0$

$\alpha = \frac{\pi}{4}, \sqrt{2} \cos \frac{\pi}{4} + \sqrt{2} \sin \frac{\pi}{4} - \sqrt{2} \cos \frac{\pi}{4} = \sqrt{2} + \sqrt{2}(\sin \frac{\pi}{4} - \cos \frac{\pi}{4}) = \sqrt{2} + \sqrt{2} \times \frac{1}{\sqrt{2}} = \sqrt{2} + 1$

$A = \sin \frac{\pi}{4} - \cos \frac{\pi}{4} = \frac{1}{\sqrt{2}} - \frac{1}{\sqrt{2}} = 0$
 $A^2 = (\sin \frac{\pi}{4} - \cos \frac{\pi}{4})^2 = \sin^2 \frac{\pi}{4} + \cos^2 \frac{\pi}{4} - 2 \sin \frac{\pi}{4} \cos \frac{\pi}{4} = 1 - 2 \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}} = 1 - 1 = 0$
 $\Rightarrow A^2 = 1 - \sin \frac{\pi}{4} = 1 - \frac{1}{\sqrt{2}} = 1 - \frac{\sqrt{2}}{2} \Rightarrow A = \frac{2 - \sqrt{2}}{2}$

$\tan \alpha = \frac{y \tan \frac{\alpha}{r}}{1 - \tan^2 \frac{\alpha}{r}} = \frac{y(\frac{1}{r})}{1 - \frac{1}{r^2}} = \frac{\Delta}{10}$

 $\Rightarrow \sin \alpha = \frac{\Delta}{10}, \cos \alpha = \frac{10}{10} = 1$

$\Rightarrow \frac{\tan \alpha - \sin \alpha}{\sin \alpha - \cos \alpha} = \frac{\frac{\Delta}{10} - \frac{\Delta}{10}}{\frac{\Delta}{10} - \frac{10}{10}} = \frac{0}{\frac{\Delta - 10}{10}} = 0$

$$r \sin \alpha < r \sin 2\alpha \Rightarrow r \sin \alpha < r \sin \alpha \cos \alpha \Rightarrow \underbrace{r \sin \alpha - r \sin \alpha \cos \alpha}_{r \sin \alpha (1 - \cos \alpha)} < 0 \Rightarrow \sin \alpha < 0$$

$$\frac{\cot \alpha}{\sin \alpha} > 0 \Rightarrow \cot \alpha < 0$$

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$$\underbrace{r \sin \alpha (1 - \cos \alpha)}_{\text{كسور ايجابية}} < 0$$