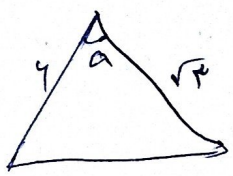
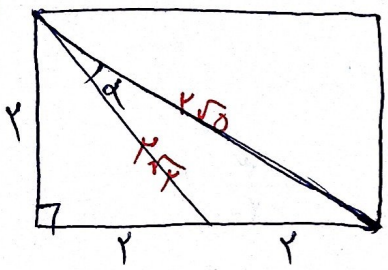
نام و نام خانوادگی ابوالفضل ابوترابی ..... پاسخنامه تشریحی تکلیف شماره ۲۷ ... کلاس یازدهم .....



$S = \frac{1}{۲}(\sqrt{۲})(۴)(\sin a) = ۲,۷ \rightarrow \sin a = \frac{\sqrt{۲}}{۲} \Rightarrow a = ۴۵^\circ$ یا $a = ۱۳۵^\circ$ min max

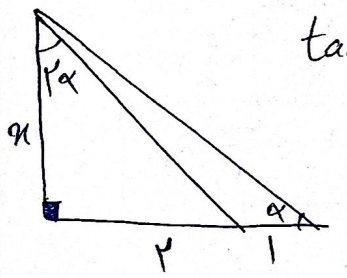
$\rightarrow \frac{۱۳۵}{۴۵} =$ ۳ برابر ۱



$۲ = \sqrt{(۲\sqrt{۲})^۲ + (۲\sqrt{۵})^۲ - ۲\sqrt{۱۰}\cos\alpha} \rightarrow ۲۸ - (۸\sqrt{۱۰})\cos\alpha = ۴$

$\rightarrow \cos\alpha = \frac{۲۴}{۸\sqrt{۱۰}} = \frac{۳}{\sqrt{۱۰}} = \frac{۳\sqrt{۱۰}}{۱۰}$ ناویسطاد α $\rightarrow \sin\alpha = \sqrt{۱ - \frac{۹}{۱۰}} = \frac{\sqrt{۱۰}}{۱۰}$ ۲

$\rightarrow \cot\alpha = \frac{\frac{۳\sqrt{۱۰}}{۱۰}}{\frac{\sqrt{۱۰}}{۱۰}} =$ ۳

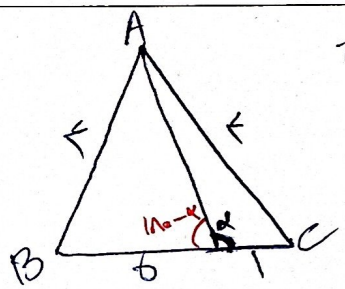


$\tan ۲\alpha = \frac{۲\tan\alpha}{۱ - \tan^۲\alpha} \rightarrow \cot ۲\alpha = \frac{۱ - \tan^۲\alpha}{۲\tan\alpha}$ $\tan\alpha = \frac{x}{۲}$

$\cot ۲\alpha = \frac{۲}{x} = \frac{۱ - \tan^۲\alpha}{۲\tan\alpha} \xrightarrow{\tan\alpha = \frac{x}{۲}} \frac{x}{۲} = \frac{۱ - \frac{x^۲}{۹}}{\frac{۲x}{۳}} \rightarrow$ ۳

$x^۲ = ۳ - \frac{x^۲}{۳} \rightarrow \frac{۴}{۳}x^۲ = ۳ \rightarrow x = \pm\frac{۳}{۲} \rightarrow x = \frac{۳}{۲}$

$\cot\alpha = \frac{۳}{x} = \frac{۳}{۱,۵} =$ ۲

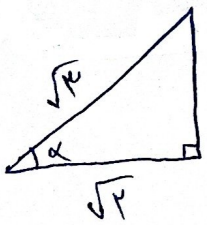


$\tan\alpha = -\tan(۱۸۰ - \alpha)$ $\beta = ۱۸۰ - \alpha$

$|\overline{AH}|^۲ = ۱۶ - ۹ = ۷ \rightarrow \overline{AH} = \sqrt{۷}$

$\tan\beta = \frac{\sqrt{۷}}{۳} \rightarrow \tan\alpha =$ $-\frac{\sqrt{۷}}{۳}$ ۴

$\underbrace{\sin^۲ x + \cos^۲ x}_{۱} + \sin^۲ y = \frac{۶}{۴} \Rightarrow \sin^۲ y = \frac{۱}{۴} \rightarrow \sin y = \pm\frac{۱}{۲}$



$\Rightarrow \tan\alpha = \pm\frac{۱}{\sqrt{۳}} \rightarrow \tan^۲\alpha =$ $\frac{۱}{۳}$ ۵

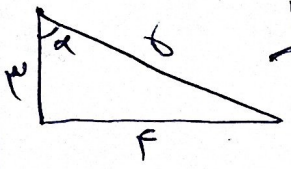
$$\frac{\sin^4\alpha + 4\cos^2\alpha}{1+\cos^2\alpha} - \frac{\cos^4\alpha - 4\sin^2\alpha}{1+\sin^2\alpha} \Rightarrow \begin{cases}\sin^4 = (\sin^2)^2 = (1-\cos^2)^2 = \cos^4 - 2\cos^2 + 1 \\ \cos^4 = (\cos^2)^2 = (1-\sin^2)^2 = \sin^4 - 2\sin^2 + 1\end{cases}$$

$$\Rightarrow \frac{(\cos^4 - 2\cos^2 + 1) + 4\cos^2}{1+\cos^2} - \frac{(\sin^4 - 2\sin^2 + 1) + 4\sin^2}{1+\sin^2} = \frac{(\cos^2+1)^2}{\cos^2+1} - \frac{(\sin^2+1)^2}{\sin^2+1}$$

$$\Rightarrow \cos^2\alpha + 1 - \sin^2\alpha - 1 = \cos^2\alpha - \sin^2\alpha = \cos 2\alpha$$

$$(\cos\alpha)(-\sin\alpha) - (-\cot\alpha) = -(\cos\alpha)(\sin\alpha) + \cot\alpha$$

$$\tan\alpha = \frac{4}{3}$$



رابع $\Rightarrow \begin{cases}\sin\alpha = -\frac{4}{5} \\ \cos\alpha = -\frac{3}{5} \\ \cot\alpha = \frac{3}{4}\end{cases}$

$$\Rightarrow \left(\frac{-3}{5}\right)\left(+\frac{4}{5}\right) + \frac{3}{4} = \frac{-12}{25} + \frac{3}{4} = \frac{-48+75}{100} = \frac{27}{100}$$

$$\sin\frac{\pi}{12} = \sin 15^\circ = \sqrt{\frac{1-\cos 30^\circ}{2}} = \sqrt{\frac{1-\frac{\sqrt{3}}{2}}{2}} = \frac{\sqrt{2-\sqrt{3}}}{2}$$

$$\cos\frac{\pi}{12} = \cos 15^\circ = \sqrt{\frac{1+\cos 30^\circ}{2}} = \sqrt{\frac{1+\frac{\sqrt{3}}{2}}{2}} = \frac{\sqrt{2+\sqrt{3}}}{2} \qquad |\sqrt{3}-1| \qquad |\sqrt{3}+1|$$

$$2\cos 30^\circ + \sqrt{2}\left(\frac{\sqrt{2-\sqrt{3}}}{2}\right) - \sqrt{2}\left(\frac{\sqrt{2+\sqrt{3}}}{2}\right) = \frac{3}{2} + \frac{\sqrt{4-2\sqrt{3}} - \sqrt{4+2\sqrt{3}}}{2}$$

$$\Rightarrow \frac{3}{2} + \frac{(-2)}{2} = \frac{1}{2}$$

$$\tan 2\alpha = \frac{2\tan\alpha}{1-\tan^2\alpha} \Rightarrow \tan\alpha = \frac{2\tan(\frac{\alpha}{2})}{1-\tan^2(\frac{\alpha}{2})} = \frac{\frac{1}{2}}{1-\frac{1}{4}} = \frac{\frac{1}{2}}{\frac{3}{4}} = \frac{4}{6} = \frac{8}{12}$$

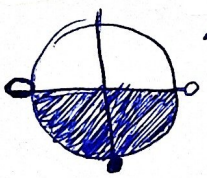
$$\tan\frac{\alpha}{2} = \frac{1}{4} \longrightarrow \tan\alpha > 0 \longrightarrow \alpha = \text{ربع اول یا سوم}$$

$$\sin 2\alpha = \frac{2\tan\alpha}{1+\tan^2\alpha} \Rightarrow \sin\alpha = \frac{2\tan(\frac{\alpha}{2})}{1+\tan^2(\frac{\alpha}{2})} = \frac{\frac{1}{2}}{1+\frac{1}{4}} = \frac{8}{12}$$

$$\cos 2\alpha = \frac{1-\tan^2\alpha}{1+\tan^2\alpha} \Rightarrow \cos\alpha = \frac{1-\tan^2(\frac{\alpha}{2})}{1+\tan^2(\frac{\alpha}{2})} = \frac{15}{17} \Rightarrow \frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{8}{15} - \frac{8}{17}}{\frac{8}{17} - \frac{15}{17}} = \frac{-14}{105}$$

$$\sin 2\alpha = 2\sin\alpha\cos\alpha \longrightarrow 2\sin\alpha < \sin 2\alpha \longrightarrow \sin\alpha < \sin\alpha\cos\alpha$$

اگر $\sin\alpha$ و $\cos\alpha$ هر دو بین ۱ و ۱- هستند و ضرب ۲ عدد بین ۱ و ۱- از نظر اندازه باعث کوچک شدن حاصل عبارت از هر یک از آن دو عددی شود پس:



$$\cot\alpha < 0 \Rightarrow \frac{\cos\alpha}{\sin\alpha} \longrightarrow \cos\alpha > 0 \Rightarrow \alpha = \text{ربع چهارم}$$