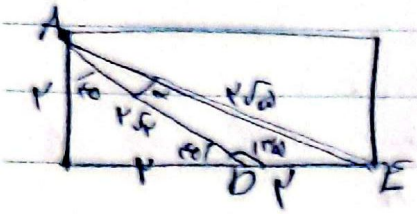
$\frac{1}{2}\sin\alpha \times \sqrt{10} \times 4 = \frac{9}{2} \rightarrow \sin\alpha = \frac{\sqrt{10}}{4} = \frac{3}{2\sqrt{10}}$ ... 1

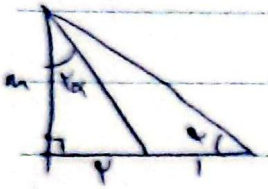
$\frac{110}{40} = 2$ برابر



$S_{AED} = \frac{1}{2} \times \sin\alpha \times 2\sqrt{2} \times 2\sqrt{2} = \frac{1}{2}\sin\alpha \times 4 \times 2$ ... 2

$\sin\alpha = \frac{1}{\sqrt{10}}$

$\cot\alpha = 3$

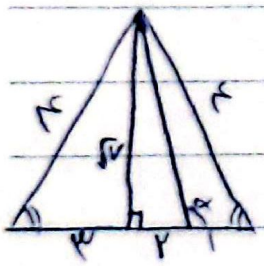


$\cot 2\alpha = \frac{1-\tan^2\alpha}{2\tan\alpha}$ $\quad \tan\alpha = \frac{x}{3}$

$\frac{x}{2} = \frac{1-\frac{m^2}{9}}{\frac{2m}{3}} \rightarrow 6m^2 = 9$ ... 3

$m = \frac{3}{2}$

$\tan\alpha = \frac{m}{3}$, $\cot\alpha = \frac{3}{x}$ $\rightarrow$ $\cot\alpha = 2$



$\tan(\pi-\alpha) = \frac{\sqrt{7}}{2} \rightarrow \tan\alpha = -\frac{\sqrt{7}}{2}$ ... 4

$\sin^2\alpha = \frac{1}{3} \rightarrow \cos^2\alpha = \frac{2}{3}$ ... 5

$\tan^2\alpha = \frac{\frac{1}{3}}{\frac{2}{3}} = \frac{1}{2}$

$\sin^2\alpha = 1-\cos^2\alpha$ ... 6

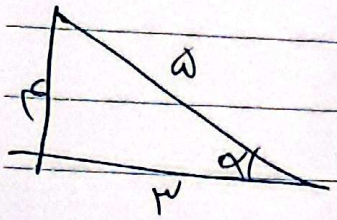
$$\frac{(1-\cos^2\alpha)^2 + 4\cos^2\alpha}{1+\cos^2\alpha} - \frac{(1-\sin^2\alpha)^2 + 4\sin^2\alpha}{1+\sin^2\alpha}$$

$$= \frac{1+\cos^4\alpha+2\cos^2\alpha}{1+\cos^2\alpha} - \frac{1+\sin^4\alpha+2\sin^2\alpha}{1+\sin^2\alpha} = \cos^2\alpha - \sin^2\alpha = \cos 2\alpha$$

$\frac{1+\cos^2\alpha}{1+\cos^2\alpha}$ $\quad \frac{1+\sin^2\alpha}{1+\sin^2\alpha}$

Year Month Date ( )

Subject



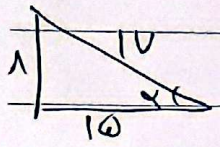
۷- $\frac{\sin(\frac{9\pi}{2}+\alpha)\cos(\frac{5\pi}{2}-\alpha)}{\cos\alpha} - \frac{\tan(\alpha-\frac{3\pi}{2})}{-\sin\alpha} + \cot\alpha$

$= \frac{-4\times 3}{5\times 5} + \frac{3}{4} = \frac{27}{100}$

۸- $3\cos\frac{\pi}{3} + \sqrt{2}\,\frac{(\sin x-\cos x)}{\sqrt{2}\sin(x-\frac{\pi}{4})} = \frac{3}{2} + \frac{-\sqrt{2}\times\sqrt{2}}{2} = \frac{1}{2}$

$\sin\left(\frac{5\pi}{12}-\frac{3\pi}{4}\right) = \sin\left(-\frac{\pi}{6}\right) = -\frac{1}{2}$

۹- $\tan\alpha = \frac{2\tan(\frac{\alpha}{2})}{1-\tan^2(\frac{\alpha}{2})} \longrightarrow \tan\alpha = \frac{\frac{1}{2}}{1-\frac{1}{16}} = \frac{8}{15}$



$\frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}} = \frac{\frac{8\times17-8\times15}{15\times17}}{\frac{-7}{17}} = \frac{-16\times16}{255\times7} = \frac{-16}{105}$

۱۰- $2\sin\alpha < 2\sin\alpha\cos\alpha \xrightarrow{\cos\alpha<1} \sin\alpha < 0$

$\Rightarrow$ غیرممکن

$0 < \frac{\cos\alpha}{\sin^2\alpha} \longrightarrow \cos\alpha > 0$