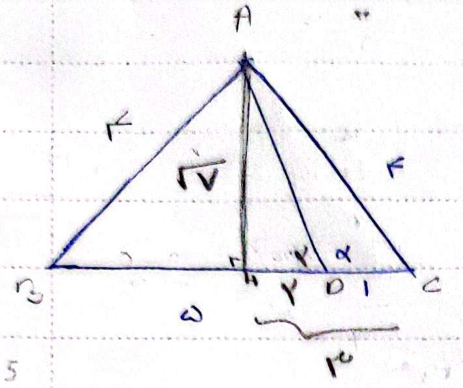
Subject

Year Month Date ( )



$\tan\alpha$ (14

$AH = \sqrt{16-9} = \sqrt{7}$

$\hat{D}_2 = \pi - \alpha$

$\tan(\pi-\alpha) = -\tan\alpha = -\frac{\sqrt{7}}{3}$

$2\sin^2 x + \cos^2 x = \frac{4}{3} \qquad \tan^2 x = ?$ (15

$\sin^2 x = \frac{1}{3} = \frac{1-\cos 2x}{2} \rightarrow \cos 2x = \frac{1}{3}$

$\tan^2 x = \frac{1-\cos 2x}{1+\cos 2x} = \frac{1-\frac{1}{3}}{1+\frac{1}{3}} = \frac{2}{4} = \frac{1}{2}$

1/2

$\frac{\sin^4\alpha + 4\cos^2\alpha}{1+\cos^2\alpha} - \frac{\cos^4\alpha + 4\sin^2\alpha}{1+\sin^2\alpha} \rightarrow \frac{\sin^4\alpha + \cos^2\alpha + \sin^2\alpha}{\cos^2\alpha + \sin^2\alpha}$ (9

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

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

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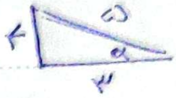
۷)

$\tan\alpha = \frac{4}{3}$ $\alpha \rightarrow$ ربع سوم

$\sin\left(\frac{9\pi}{2}+\alpha\right)\cos\left(\frac{7\pi}{2}-\alpha\right) - \tan\left(\alpha - \frac{3\pi}{2}\right)$ ($\frac{9\pi}{2}+\alpha \rightarrow \frac{\pi}{2}+\alpha$ ، $\frac{7\pi}{2}-\alpha \rightarrow \frac{3\pi}{2}-\alpha$)



$= -\cos\alpha \times (-\sin\alpha) + \cot\alpha = -\frac{3}{5}\times\frac{4}{5}+\frac{3}{4}$

$= \frac{-12}{25}+\frac{3}{4} = \frac{-48+75}{100} = 0.27$

۱۸)

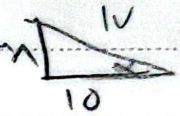
$3\cos 4x + \frac{\sqrt{2}}{2}\times 2\sin x - \frac{\sqrt{2}}{2}\times 2\cos x$ ($\frac{\sqrt{2}}{2} \rightarrow \cos\frac{\pi}{4}$ ، $\frac{\sqrt{2}}{2} \rightarrow \sin\frac{\pi}{4}$)

$= 3\times\cos\frac{\pi}{3} + 2\sin\left(\frac{\pi}{12}-\frac{\pi}{4}\right) = 3\times\frac{1}{2} - \frac{2}{2} = \frac{1}{2}$

$\left(\frac{\pi}{12}-\frac{\pi}{4} = -\frac{\pi}{6}\right)$

۱۴)

$\tan\frac{\alpha}{2} = \frac{1}{4} \rightarrow \tan\alpha = \frac{\frac{1}{2}}{1-\frac{1}{16}} = \frac{\frac{1}{2}}{\frac{15}{16}} = \frac{8}{15} \rightarrow$



$\frac{\tan\alpha - \sin\alpha}{\sin\alpha - \cos\alpha} = \frac{\frac{8}{15}-\frac{8}{17}}{\frac{8}{17}-\frac{15}{17}} = \frac{8\left(\frac{2}{15\times 17}\right)}{\frac{-7}{17}} = \frac{16}{15\times -7} = \frac{16}{-105}$

$225 + 64 = 289$

۱۰)

$\frac{\cot\alpha}{\sin\alpha} > 0 \rightarrow \frac{\cos\alpha}{\sin^2\alpha} > 0 \rightarrow \cos\alpha > 0$ ($\sin^2\alpha \rightarrow$ همیشه +)

$2\sin\alpha < \sin 2\alpha \rightarrow 2\sin\alpha < 2\sin\alpha\cos\alpha \rightarrow \sin\alpha(\cos\alpha - \sin\alpha) > 0$

$\rightarrow \sin\alpha(\cos\alpha - 1) > 0$

مثبت ($\cos\alpha$ همواره کمتر از ۱)

$\rightarrow \cos\alpha - 1 < 0 \rightarrow \sin\alpha < 0 \Longrightarrow$ α در ناحیه چهارم

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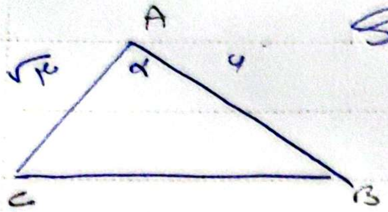
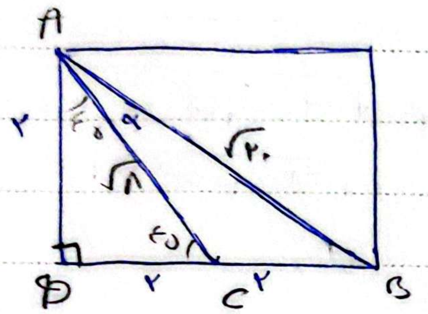
ستایش عوض‌زاد یازدهم ریاضی A تکلیف ۲۷



(۱ $S_{ABC} = ۴/۵$ $\max\alpha$, $\min\alpha = ?$

$S = \frac{1}{۲} AB \times AC \times \sin\hat{A} = ۴/۵ = \frac{1}{۲} \times ۶ \times \sqrt{۳} \times \sin\hat{A}$

$\rightarrow \sin\hat{\alpha} = \frac{۱/۵}{\sqrt{۳}} = \frac{۳}{۲\sqrt{۳}} = \frac{\sqrt{۳}}{۲} \rightarrow \hat{\alpha} = ۶۰^\circ$ یا ۱۲۰° (min, max)



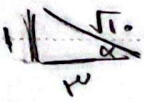
(۲ $\cot\hat{\alpha} = ?$

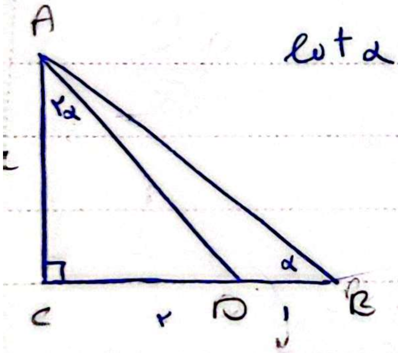
$AC = \sqrt{۴+۴} = \sqrt{۸}$ فیثاغورس

$AB = \sqrt{۱۶+۴} = \sqrt{۲۰}$ فیثاغورس

$S_{ABC} = S_{ABD} - S_{ACD} = \frac{1}{۲} AB \times AC \times \sin\alpha$

$\sqrt{۲۰} \times \sqrt{۸} \times \sin\alpha = ۴ \times ۲ - ۴ = ۴ \rightarrow$

$\sin\alpha = \frac{1}{\sqrt{۱۰}} \rightarrow$  $\rightarrow \cot\hat{\alpha} = ۳$



(۳ $\cot\alpha = ?$

$\tan\alpha = \frac{x}{۳}$ $\tan ۲\alpha = \frac{۲}{x}$

$\tan ۲\alpha = \frac{۲\tan\alpha}{1-\tan^۲\alpha} = \frac{۲}{x} = \frac{۲ \times \frac{x}{۳}}{1 - \frac{x^۲}{۹}}$

$\rightarrow \frac{x^۲}{۳} = \frac{۹ - x^۲}{۹} \rightarrow ۳x^۲ = ۹ - x^۲ \rightarrow ۴x^۲ - ۹ = ۰$

$\rightarrow x = \frac{۳}{۲}$ ✓ یا $-\frac{۳}{۲}$ ✗ $\cot\alpha = \frac{۳}{x} = \frac{۳}{\frac{۳}{۲}} = ۲$