Math 49B (8:30am – 9:20am)
Quiz 1 Version B
Mon Jan 10, 2011

What month is your birthday ? ___ ___
What are the first 2 digits of your address ? ___ ___
What are the last 2 digits of your zip code ? ___ ___
What are the last 2 digits of your DeAnza ID number ? ___ ___

SCORE: ___ / 20 POINTS

NO CALCULATORS ALLOWED

YOU MUST SHOW PROPER WORK TO RECEIVE FULL CREDIT

Use the trigonometric substitution $x = 3\csc\theta$ **SCORE: ___ / 3 POINTS**

to write the algebraic function $\sqrt{4x^2 - 36}$ as a trigonometric function. Simplify your answer. (Assume $0 < \theta \leq \frac{\pi}{2}$.)

$\sqrt{4(3\csc\theta)^2 - 36}$

$= \sqrt{36\csc^2\theta - 36}$ 1

$= 6\sqrt{\csc^2\theta - 1}$

$= 6\sqrt{\cot^2\theta}$ $\frac{1}{2}$ 1

$= 6\cot\theta$ $\frac{1}{2}$

Prove that $\dfrac{\cot x \cos x}{1 - \sin x} - 1 = \csc x$. **SCORE: ___ / 6 POINTS**

$= \dfrac{\frac{\cos x}{\sin x} \cdot \cos x}{1 - \sin x} - 1$ 1

$= \dfrac{\cos^2 x}{\sin x(1 - \sin x)} - 1$ 1

$= \dfrac{\cos^2 x - \sin x(1 - \sin x)}{\sin x(1 - \sin x)}$ 1

$= \dfrac{\cos^2 x - \sin x + \sin^2 x}{\sin x(1 - \sin x)}$ 1

$= \dfrac{\cos^2 x + \sin^2 x - \sin x}{\sin x(1 - \sin x)}$

$= \dfrac{1 - \sin x}{\sin x(1 - \sin x)}$ 1

$= \dfrac{1}{\sin x} = \csc x$ 1

$-\frac{1}{2}$ IF FORGOTTEN

➡

If $\sec x = \frac{3}{2}$ and $\tan x < 0$, find $\cot x$ using the fundamental identities **(NOT TRIANGLES)**. **SCORE: ___ / 3 POINTS**

$\tan^2 x = \sec^2 x - 1$

$= \left(\frac{3}{2}\right)^2 - 1$ OR $\frac{1}{2}$

$= \frac{5}{4}$ $\frac{1}{2}$

$\tan x = -\frac{\sqrt{5}}{2}$ 1

$\cot x = \frac{1}{\tan x} \overset{\frac{1}{2}}{=} -\frac{2}{\sqrt{5}}$ $\frac{1}{2}$

Using the fundamental identities, simplify $\cos(-m)\sec\left(\frac{\pi}{2} - m\right)$. **SCORE: ___ / 2 POINTS**

$\overset{\frac{1}{2}}{=} \cos m \csc m$ $\frac{1}{2}$

$= \cos m \frac{1}{\sin m}$ $\frac{1}{2}$

$= \frac{\cos m}{\sin m}$ OR

$= \cot m$ $\frac{1}{2}$

Prove that $\cot x - \sec x \csc x = -\tan x$. **SCORE: ___ / 6 POINTS**

$= \frac{\cos x}{\sin x} - \frac{1}{\cos x} \frac{1}{\sin x}$ 1 1 1

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

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

$= \frac{-\sin x}{\cos x}$ 1

OR JUST CANCEL $\sin x$ IN PREVIOUS STEP

$= \tan x$

$-\frac{1}{2}$ IF FORGOTTEN