

Math 130 - Quiz 6 IC

October 2, 2019

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz.

1. (3 points) Verify the following identity:

$$\cos x \tan x \csc x = 1$$

$$\left(\frac{\cancel{\cos x}}{1}\right) \left(\frac{\cancel{\sin x}}{\cos x}\right) \left(\frac{1}{\cancel{\sin x}}\right) = 1 \checkmark$$

2. (3 points) Verify the following identity:

$$\frac{\tan \theta + \cot \theta}{\tan \theta} = \csc^2 \theta$$

$$\begin{aligned} \frac{\cancel{TAN} \theta}{\cancel{TAN} \theta} + \frac{\cot \theta}{\cancel{TAN} \theta} &= 1 + (\cot \theta) \left(\frac{1}{\cancel{TAN} \theta}\right) \\ &= 1 + \cot^2 \theta = \csc^2 \theta \checkmark \end{aligned}$$

Math 130 - Quiz 6 TH

October 2, 2019

Name key

Score _____

Show all work to receive full credit. Supply explanations when necessary. You must work individually on this quiz. This quiz is due October 7.

1. (3 points) Verify the following identity:

$$\frac{1 + \sin x}{\cos x} + \frac{\cos x}{1 + \sin x} = 2 \sec x$$

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

$1 - \sin^2 x = \cos^2 x$

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

$$\frac{2 \cos x}{\cos^2 x} = \frac{2}{\cos x} = 2 \sec x \quad \checkmark$$

2. (3 points) Verify the following identity:

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

↓

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

$\cos^2 x$

$$= \frac{1 + 2 \sin x + \sin^2 x}{\cos^2 x} \quad \checkmark$$

Turn over.

3. (3 points) Find all solutions: $2 \sin x \cos x = \sin x$

$$2 \sin x \cos x - \sin x = 0$$

$$\sin x (2 \cos x - 1) = 0$$



$$\sin x = 0$$



$$x = 0, \pi$$



$$\cos x = \frac{1}{2}$$



$$x = \frac{\pi}{3}, \frac{5\pi}{3}$$

All solutions ...

$$x = k\pi, \quad x = \frac{\pi}{3} + 2k\pi, \quad x = \frac{5\pi}{3} + 2k\pi,$$

k is any integer.