

Math 112: Quiz 7.1:

There are many correct ways to do these, I'm just showing my favorite.

1. Simplify the following expression (show your steps):

$$\cos t \csc t$$

↓

$$\cos t \cdot \frac{1}{\sin t} = \frac{\cos t}{\sin t} \rightarrow \cot t$$

reciprocal
reciprocal
or
Quotient

2. Verify the following identity (show and verify your steps):

$$\tan x \sin x + \cos x = \sec x$$

+2

↓

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

reciprocal
or
Quotient

↓

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

←

$$\sec x$$

reciprocal pythagorean

3. Make the indicated trigonometric substitution in the given algebraic expression and simplify: Assume $0 \leq \theta \leq \pi/2$

$$\sqrt{25 - x^2}, \quad x = 5 \cos \theta$$

Pythagorean ID:
 $1 - \cos^2 \theta = \sin^2 \theta$

+2

$$\sqrt{25 - (5 \cos \theta)^2} = \sqrt{25 - 25 \cos^2 \theta} = \sqrt{25(1 - \cos^2 \theta)} = 5 \sqrt{\sin^2 \theta}$$

$$= \underline{5 \sin \theta}$$