

Quiz 6

Math 252

Name:

$$\sin 2x = 2 \sin x \cos x$$

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

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

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

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

$$\sin x \cos y = \frac{1}{2}[\sin(x - y) + \sin(x + y)]$$

$$\sin x \sin y = \frac{1}{2}[\cos(x - y) - \cos(x + y)]$$

$$\cos x \cos y = \frac{1}{2}[\cos(x - y) + \cos(x + y)]$$

Show *all* your work (algebraically or geometrically) for each and simplify. No credit is given without supporting work.

1. [5] Evaluate the following:

$$\int \tan^3 x \sec x \, dx$$

$$\int \sin^3 x \sqrt{\cos x} \, dx$$

2. [5] During class on Wednesday I said that trigonometric substitution can more appropriately be called inverse substitution. Explain why this statement is true and why one would want to do such a thing. Include an example.