

Lesson 6.2A – Trigonometric Expressions

I. Trigonometric Identities (You are responsible for knowing these. Relax... there are tricks).

| Reciprocal Identities | Quotient Identities | Pythagorean Identities |
|-----------------------------|----------------------------------|---------------------------|
| $\sin u = \frac{1}{\csc u}$ | $\tan u = \frac{\sin u}{\cos u}$ | $\sin^2 u + \cos^2 u = 1$ |
| $\csc u = \frac{1}{\sin u}$ | $\cot u = \frac{\cos u}{\sin u}$ | $1 + \tan^2 u = \sec^2 u$ |
| $\cos u = \frac{1}{\sec u}$ | | $1 + \cot^2 u = \csc^2 u$ |
| $\sec u = \frac{1}{\cos u}$ | | |
| $\tan u = \frac{1}{\cot u}$ | | |
| $\cot u = \frac{1}{\tan u}$ | | |

Simplify.

1. $\cos \theta \tan \theta$

2. $\sec^2 x(1 - \sin^2 x)$

3. $\sin^2 x \csc^2 x - \sin^2 x$

4. $\frac{\cot \theta}{\csc \theta}$

II. Practice: Simplify the trigonometric expressions. There is more than one correct form... but some forms are simpler-looking than others. Do your best!

5. $\frac{\csc \theta}{\sec \theta}$

6. $\sec \theta \cos \theta$

$$7. \frac{\sec^2 \theta - 1}{\sec^2 \theta}$$

$$8. -\cos^2 \theta - \tan^2 \theta \cos^2 \theta$$

$$9. \frac{1 - \cos^2 x}{\sin x}$$

$$10. (1 + \tan^2 x) \cos x$$

$$11. 2 \tan^2 x - 2 \sec^2 x$$

$$12. \frac{\cos^2(x) - 4}{\cos(x) - 2}$$