

## Lesson 7.1: Trigonometric Identities

### Fundamental Trig Identities

Reciprocal Identities		
Pythagorean Identities		
Even-Odd Identities		
Cofunction Identities		

### Simplifying Trigonometric Expressions

We can use the above trig identities to help us \_\_\_\_\_ the same trigonometric expression in different ways.

Example: Simplify the expression  $\cos(t) + \tan(t) \sin(t)$ .

### Proving Trigonometric Identities

There are several other trigonometric identities that follow from the fundamental identities in the text box we created. As a result, we are able to prove new trig identities using the fundamental identities.

Guidelines for Proving Trigonometric Identities:

- 1.
- 2.
- 3.

Examples:

1. Verify algebraically that  $\cos(\theta) (\sec(\theta) - \cos(\theta)) = \sin^2(\theta)$

2. Verify algebraically that  $2 \tan(x) \sec(x) = \frac{1}{1-\sin(x)} - \frac{1}{1+\sin(x)}$

3. Verify algebraically that  $\frac{1+\cos(\theta)}{\cos(\theta)} = \frac{\tan^2(\theta)}{\sec(\theta)-1}$

4. Substitute  $\sin(\theta)$  for  $x$  in the expression  $\sqrt{1-x^2}$  and simplify. Assume that  $0 \leq \theta \leq \frac{\pi}{2}$ .