

Name: \_\_\_\_\_

Date: \_\_\_\_\_

**Learning Goal 6.1**

Using identities to reduce complexity in expressions and solve equations.

**Formula Sheet****Pythagorean Identities**

$$\sin^2 x + \cos^2 x = 1 \quad \tan^2 x + 1 = \sec^2 x$$

$$1 + \cot^2 x = \csc^2 x$$

**Quotient Identities**

$$\tan x = \frac{\sin x}{\cos x} \quad \cot x = \frac{\cos x}{\sin x}$$

$$\csc x = \frac{1}{\sin x} \quad \sec x = \frac{1}{\cos x} \quad \cot x = \frac{1}{\tan x}$$

**Sum and Difference Identities**

$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$

$$\sin(A + B) = \sin A \cos B + \cos A \sin B$$

$$\cos(A - B) = \cos A \cos B + \sin A \sin B$$

$$\sin(A - B) = \sin A \cos B - \cos A \sin B$$

$$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$

**Double Angle Identities**

$$\begin{aligned} \cos 2A &= \cos^2 A - \sin^2 A \\ &= 2 \cos^2 A - 1 \\ &= 1 - 2 \sin^2 A \end{aligned}$$

$$\begin{aligned} \sin 2A &= 2 \sin A \cos A \\ \tan 2A &= \frac{2 \tan A}{1 - \tan^2 A} \end{aligned}$$