

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

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

**Learning Goal 6.1**

Using identities to reduce complexity in expressions and solve equations.

**More Questions****Double Angle Identities**

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

$$\sin 2A = 2 \sin A \cos A$$

$$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$$

- Prove the identities using the Pythagorean identities.
  - $\cos 2A = 2 \cos^2 A - 1$
  - $\cos 2A = 1 - 2 \sin^2 A$
- Express the following as a single trigonometric function of a single angle (do not evaluate).
  - $2 \sin\left(\frac{\pi}{5}\right) \cos\left(\frac{\pi}{5}\right)$
  - $4 \cos^2 35^\circ - 2$
  - $\sin 60^\circ \cos 60^\circ$
- If  $\cos A = \frac{5}{7}$  and  $\angle A$  is in the fourth quadrant, find the exact value of  $\sin 2A$ .
- Prove the following equation.

$$\frac{\sin 3x}{\sin x \cos x} = 4 \cos x - \sec x$$