NAME _____ DATE _____ PERIOD _____

Practice

Double-Angle and Half-Angle Identities

Use a half-angle identity to find the exact value of each function.

1. $\sin 105°$

2. $\tan \frac{\pi}{8}$

3. $\cos \frac{5\pi}{8}$

Use the given information to find sin 2θ, cos 2θ, and tan 2θ.

4. $\sin \theta = \frac{12}{13}, 0° < \theta < 90°$

5. $\tan \theta = \frac{1}{2}, \pi < \theta < \frac{3\pi}{2}$

6. $\sec \theta = -\frac{5}{2}, \frac{\pi}{2} < \theta < \pi$

7. $\sin \theta = \frac{3}{5}, 0 < \theta < \frac{\pi}{2}$

Verify that each equation is an identity.

8. $1 + \sin 2x = (\sin x + \cos x)^2$

9. $\cos x \sin x = \frac{\sin 2x}{2}$

10. ***Baseball*** A batter hits a ball with an initial velocity v_0 of 100 feet per second at an angle θ to the horizontal. An outfielder catches the ball 200 feet from home plate. Find θ if the range of a projectile is given by the formula $R = \frac{1}{32}v_0^2 \sin 2\theta$.