

Verify.

$$1. \frac{\tan x \cos x}{\sin x} = 1$$

$$2. \frac{1 + \tan^2 \theta}{\csc^2 \theta} = \tan^2 \theta$$

$$3. \sin \theta + \cos \theta = \frac{1 + \tan \theta}{\sec \theta}$$

$$4. \sec^4 \alpha - \sec^2 \alpha = \frac{1}{\cot^4 \alpha} + \frac{1}{\cot^2 \alpha}$$

Use the given information and the Pythagorean identities to determine the exact trigonometric value.

$$5. \text{ Given } \sec \theta = -\frac{7}{5}, 180^\circ < \theta < 270^\circ, \text{ find } \sin \theta.$$

$$6. \text{ Given } \cot \theta = -\frac{2}{5}, \csc \theta > 0, \text{ find } \cos \theta.$$