

**Key**

Name: \_\_\_\_\_ per. \_\_\_\_\_

1. Use trig identities to simplify each expression

$$a. \frac{\sin^2 \theta - \cos^2 \theta}{\sin^2 \theta - \sin \theta \cos \theta}$$

$$= \frac{\sin^2 \theta - \cos^2 \theta}{\sin \theta (\sin \theta - \cos \theta)}$$

$$= \frac{(\sin \theta + \cos \theta)(\sin \theta - \cos \theta)}{\sin \theta (\sin \theta - \cos \theta)}$$

$$= 1 + \cot \theta$$

$$c. (\sin t + \cos t)(\sin t - \cos t) + 1$$

$$= \sin^2 t - \cos^2 t + 1$$

$$= \frac{1 - \cos^2 t + \sin^2 t}{1}$$

$$= \sin^2 t + \sin^2 t$$

$$= 2\sin^2 t$$

$$e. \cos^2 x + \cos^2 x \cot^2 x$$

$$= \cos^2 x (1 + \cot^2 x)$$

$$= \cos^2 x (\csc^2 x)$$

$$= \cos^2 x \cdot \frac{1}{\sin^2 x} = \cot^2 x$$

$$g. \tan^4 \theta + 2\tan \theta + 1$$

$$= (\tan^2 + 1)(\tan^2 + 1)$$

$$= \sec^2 \theta \sec^2 \theta$$

$$= \sec^4 \theta$$

$$b. \tan^2 \theta (\csc^2 \theta - 1)$$

$$= \tan^2 \theta \cdot \cot^2 \theta$$

$$= \tan^2 \theta \cdot \frac{1}{\tan^2 \theta}$$

$$= 1$$

$$d. (\sin t - \cos t)^2$$

$$= \sin^2 t - 2\sin t \cos t + \cos^2 t$$

$$= 1 - 2\sin t \cos t$$

$$f. (\cot \theta + \csc \theta)(\cot \theta - \csc \theta)$$

$$\cot^2 \theta - \csc^2 \theta = -1$$