

## 7-3

NAME \_\_\_\_\_ DATE \_\_\_\_\_ PERIOD \_\_\_\_\_

## Practice

## Sum and Difference Identities

Use sum or difference identities to find the exact value of each trigonometric function.

$$1. \cos \frac{5\pi}{12}$$

$$\frac{\sqrt{6} - \sqrt{2}}{4}$$

$$2. \sin(-165^\circ)$$

$$\frac{\sqrt{2} - \sqrt{6}}{4}$$

$$3. \tan 345^\circ$$

$$\sqrt{3} - 2$$

$$4. \csc 915^\circ$$

$$-\sqrt{6} - \sqrt{2}$$

$$5. \tan\left(-\frac{7\pi}{12}\right)$$

$$2 + \sqrt{3}$$

$$6. \sec \frac{\pi}{12}$$

$$\sqrt{6} - \sqrt{2}$$

Find each exact value if  $0 < x < \frac{\pi}{2}$  and  $0 < y < \frac{\pi}{2}$ .

$$7. \cos(x + y) \text{ if } \sin x = \frac{5}{13} \text{ and } \sin y = \frac{4}{5}$$

$$\frac{16}{65}$$

$$8. \sin(x - y) \text{ if } \cos x = \frac{8}{17} \text{ and } \cos y = \frac{3}{5}$$

$$\frac{13}{85}$$

$$9. \tan(x - y) \text{ if } \csc x = \frac{13}{5} \text{ and } \cot y = \frac{4}{3}$$

$$-\frac{16}{63}$$

Verify that each equation is an identity.

$$10. \cos(180^\circ - \theta) = -\cos \theta$$

$$\cos(180^\circ - \theta)$$

$$= \cos 180^\circ \cos \theta + \sin 180^\circ \sin \theta$$

$$= (-1) \cos \theta + 0 \cdot \sin \theta$$

$$= -\cos \theta$$

$$11. \sin(360^\circ + \theta) = \sin \theta$$

$$\sin(360^\circ + \theta)$$

$$= \sin 360^\circ \cos \theta + \cos 360^\circ \sin \theta$$

$$= 0 \cdot \cos \theta + 1 \cdot \sin \theta$$

$$= \sin \theta$$

12. **Physics** Sound waves can be modeled by equations of the form  $y = 20 \sin(3t + \theta)$ . Determine what type of interference results when sound waves modeled by the equations  $y = 20 \sin(3t + 90^\circ)$  and  $y = 20 \sin(3t + 270^\circ)$  are combined. (Hint: Refer to the application in Lesson 7-3.)

**The interference is destructive. The waves cancel each other completely.**