

Practice

Sum and Difference Identities

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

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

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

3. $\tan 345^\circ$

4. $\csc 915^\circ$

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

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

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

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

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

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

Verify that each equation is an identity.

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

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

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.)