

LESSON
14.3**Practice B**

For use with pages 923–930

Find the values of the other five trigonometric functions of θ .

1. $\sin \theta = -\frac{15}{17}, \pi < \theta < \frac{3\pi}{2}$

2. $\tan \theta = \frac{3}{4}, 0 < \theta < \frac{\pi}{2}$

3. $\cos \theta = -\frac{1}{2}, \frac{\pi}{2} < \theta < \pi$

4. $\sec \theta = \sqrt{5}, \frac{3\pi}{2} < \theta < 2\pi$

Simplify the expression.

5. $\sec(-x) \cot(-x) \sin(-x)$

6. $\frac{\cos^2 x}{\sin x} + \sin x$

7. $\frac{1 - \cos^2 x}{\cos^2 x}$

8. $\sin^3 x + \cos\left(\frac{\pi}{2} - x\right) \cos^2 x$

9. $\csc(-x) - \csc(-x) \cos^2 x$

10. $\frac{1 + \sec(-x)}{\sin(-x) + \tan(-x)}$

Verify the identity.

11. $\cos x \sec x = 1$

12. $1 - \tan^2 x = 2 - \sec^2 x$

13. $\frac{\tan^2 x}{\sec x} = \sec x - \cos x$

14. $\tan\left(\frac{\pi}{2} - x\right) \sin x = \cos x$

15. $\frac{\cos^2 x}{1 + \tan^2 x} + \frac{\sin^2 x}{\sec^2 x} = \cos^2 x$

16. $\frac{\sin\left(\frac{\pi}{2} - x\right) - 1}{1 - \cos(-x)} = -1$

- 17. Rate of Change** In calculus, it can be shown that the rate of change of the function $f(x) = \sec x \cot x$ is given by the expression:

$$-\csc^2 x \sec x + \cot x \sec x \tan x.$$

Show that this expression for the rate of change can be written as $-\csc x \cot x$.

- 18. Using Identities** Use the cotangent identity to describe what happens to the value of $\cot \theta$ as the value of $\cos \theta$ decreases and the value of $\sin \theta$ increases. On what intervals does this happen?