Name _____ Date _____

In Exercises 1–6, find the values of the other five trigonometric functions of θ.

1. $\sin \theta = \dfrac{3}{8}, \dfrac{\pi}{2} < \theta < \pi$

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

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

4. $\cot \theta = \dfrac{10}{3}, \pi < \theta < \dfrac{3\pi}{2}$

5. $\sec \theta = -\dfrac{9}{5}, \dfrac{\pi}{2} < \theta < \pi$

6. $\csc \theta = -\dfrac{7}{2}, \dfrac{3\pi}{2} < \theta < 2\pi$

In Exercises 7–12, simplify the expression.

7. $\sin x\left(\cot^2 x + 1\right)$

8. $\dfrac{\cot(-\theta)}{\cos(-\theta)}$

9. $\cos\left(\dfrac{\pi}{2} - \theta\right) \cot \theta$

10. $\dfrac{\tan^2 \theta - \sec^2 \theta}{\cos\left(\dfrac{\pi}{2} - \theta\right) \sec \theta}$

11. $\dfrac{\sin(-x)}{\tan(-x) \sec x} + \sin^2 x$

12. $\dfrac{\csc^2 x - \tan x \cot x}{\csc x - 1}$

13. Describe and correct the error in simplifying the expression.

$$\begin{aligned}
\cancel{}\quad \csc \theta \cot \theta \cos \theta &= \dfrac{1}{\cos \theta} \cdot \dfrac{\cos \theta}{\sin \theta} \cdot \cos \theta \\
&= \dfrac{\cos \theta}{\sin \theta} \\
&= \cot \theta
\end{aligned}$$

In Exercises 14–17, verify the identity.

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

15. $\dfrac{1 + \sin(-x)}{\cos x \tan x - 1} = -1$

16. $\dfrac{1 - \cos x}{\sin x} = \csc x - \cot x$

17. $\dfrac{1 + \sin \theta}{\cos \theta} + \dfrac{\cos \theta}{1 - \sin \theta} = 2 \sec \theta + 2 \tan \theta$

18. Use the sine and cosine functions to verify the identity $\tan x \cot x = 1$.