Name_____ Date_____

9.1 Practice A

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

1. $\sin\theta = \frac{2}{3}, 0 < \theta < \frac{\pi}{2}$

2. $\cos\theta = -\frac{3}{5}, \frac{\pi}{2} < \theta < \pi$

3. $\tan\theta = \frac{4}{7}, \pi < \theta < \frac{3\pi}{2}$

4. $\cot\theta = -\frac{5}{4}, \frac{\pi}{2} < \theta < \pi$

5. $\sec\theta = \frac{7}{3}, \frac{3\pi}{2} < \theta < 2\pi$

6. $\csc\theta = -\frac{6}{5}, \pi < \theta < \frac{3\pi}{2}$

In Exercises 7–12, simplify the expression.

7. $\cos x \tan x$

8. $\sin x\left(\csc^2 x - 1\right)$

9. $\dfrac{\tan(-\theta)}{\sin(-\theta)}$

10. $\dfrac{\sin^2\theta}{\tan^2\theta}$

11. $\dfrac{\tan\left(\frac{\pi}{2} - x\right)}{\csc x}$

12. $\dfrac{1 - \sin^2 x}{\sec x}$

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

$$\begin{aligned} \tan^2 x + \sec^2 x &= \tan^2 x + \left(\tan^2 x - 1\right) \\ &= \tan^2 x + \tan^2 x - 1 \\ &= 2\tan^2 x - 1 \end{aligned}$$

In Exercises 14–17, verify the identity.

14. $\tan x \cot x = 1$

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

16. $\dfrac{\sin^2 x + \left(1 - \cos^2 x\right)}{\tan x \cos x} = 2\sin x$

17. $\dfrac{\cos^2(-x)\csc x}{\cot x} = \cos x$

18. As the value of $\sin\theta$ decreases, what happens to the value of $\csc\theta$? Explain your reasoning.