NAME _____ DATE _____ PERIOD _____

14-1 Practice

Trigonometric Identities

Find the exact value of each expression if $0° < \theta < 90°$.

1. If $\cos \theta = \frac{5}{13}$, find $\sin \theta$.
   $\frac{12}{13}$

2. If $\cot \theta = \frac{1}{2}$, find $\sin \theta$.
   $\frac{2\sqrt{5}}{5}$

3. If $\tan \theta = 4$, find $\sec \theta$.
   $\sqrt{17}$

4. If $\tan \theta = \frac{2}{5}$, find $\cot \theta$.
   $\frac{5}{2}$

Find the exact value of each expression if $180° < \theta < 270°$.

5. If $\sin \theta = -\frac{15}{17}$, find $\sec \theta$.
   $-\frac{17}{8}$

6. If $\csc \theta = -\frac{3}{2}$, find $\cot \theta$.
   $\frac{\sqrt{5}}{2}$

Find the exact value of each expression if $270° < \theta < 360°$.

7. If $\cos \theta = \frac{3}{10}$, find $\cot \theta$.
   $-\frac{3\sqrt{91}}{91}$

8. If $\csc \theta = -8$, find $\sec \theta$.
   $\frac{8\sqrt{7}}{21}$

9. If $\tan \theta = -\frac{1}{2}$, find $\sin \theta$.
   $-\frac{\sqrt{5}}{5}$

10. If $\cos \theta = \frac{1}{3}$, find $\cot \theta$.
    $-\frac{\sqrt{2}}{4}$

Simplify each expression.

11. $\csc \theta \tan \theta$ $\sec \theta$

12. $\frac{\sin^2 \theta}{\tan^2 \theta}$ $\cos^2 \theta$

13. $\sin^2 \theta \cot^2 \theta$ $\cos^2 \theta$

14. $\cot^2 \theta + 1$ $\csc^2 \theta$

15. $\frac{\csc^2 \theta - \cot^2 \theta}{1 - \cos^2 \theta}$ $\csc^2 \theta$

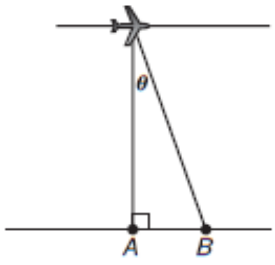
16. $\frac{\csc \theta - \sin \theta}{\cos \theta}$ $\cot \theta$

17. $\sin \theta + \cos \theta \cot \theta$
    $\csc \theta$

18. $\frac{\cos \theta}{1 - \sin \theta} - \frac{\cos \theta}{1 + \sin \theta}$
    $2 \tan \theta$

19. $\sec^2 \theta \cos^2 \theta - \tan^2 \theta$
    $\sec^2 \theta$

20. **AERIAL PHOTOGRAPHY** The illustration shows a plane taking an aerial photograph of point A. Because the point is directly below the plane, there is no distortion in the image. For any point B not directly below the plane, however, the increase in distance creates distortion in the photograph. This is because as the distance from the camera to the point being photographed increases, the exposure of the film reduces by $(\sin \theta)(\csc \theta - \sin \theta)$. Express $(\sin \theta)(\csc \theta - \sin \theta)$ in terms of $\cos \theta$ only. $\cos^2 \theta$



21. **WAVES** The equation $y = a \sin \theta t$ represents the height of the waves passing a buoy at a time t in seconds. Express a in terms of $\csc \theta t$. $a = y \csc \theta t$