Name _____

HW 7-5

1. Simplify the trigonometric expressions.

a. $\cos x \cdot \sec x$

b. $\sin x \cdot \cot x$

2. If $\sin\theta = 0.788$ and $\cos\theta = 0.616$, find each of the following. Round to the nearest thousandth.

a. $\sec\theta$

b. $\cot\theta$

c. $\csc\theta$

d. $\tan\theta$

3. Find the exact value of each of the following to show that the Pythagorean identity holds true for $\theta = \frac{2\pi}{3}$.

a. Find $\sin \frac{2\pi}{3}$

b. Find $(\sin \frac{2\pi}{3})^2$

c. Find $\cos \frac{2\pi}{3}$

d. Find $(\cos \frac{2\pi}{3})^2$

e. Find $(\sin \frac{2\pi}{3})^2 + (\cos \frac{2\pi}{3})^2$. How does this verify the Pythagorean identity?

4. Simplify the expression $\frac{1 - \sin^2 x}{\cot^2 x}$ to a single term.

5. Let $f(x) = 10\cos(2x) - 5$.

a. Find all x-intercepts of the graph of f on the interval $[0, 2\pi]$.

b. Let $g(x) = f(x) + 3$. Find all solutions to $g(x) = 8$ on the interval $[0, 2\pi]$.

c. Let $h(x) = 1 + \dfrac{\tan x \sec x}{\csc x}$. Write an equivalent expression for $h(x)$ that uses only one trigonometric function.

6. If $\tan^2\theta = 3$, find $\sec\theta$.

7. If $\tan\theta < \cot\theta$ and $0 < \theta < \dfrac{\pi}{2}$, which of the following statement(s) must be true?

A) $\sin\theta < \cos\theta$

B) $1 + \sec^2\theta = 1 + \csc^2\theta$

C) $\sin^2\theta + \cos^2\theta < 1$

D) None of the above

8. If $\cot\theta = \frac{5}{3}$, and θ is in quadrant I, find the exact values of $\sin\theta, \cos\theta, \tan\theta,$ and $\csc\theta.$

9. Simplify each trig expression into one number or an expression with a single trig function.

a. $\dfrac{1}{\csc x}$

b. $\dfrac{\sin^2 x + \cos^2 x}{\tan x}$

c. $\cot^2 x - \csc^2 x$

d. $(1 - \sin^2 x)(1 + \tan^2 x)$

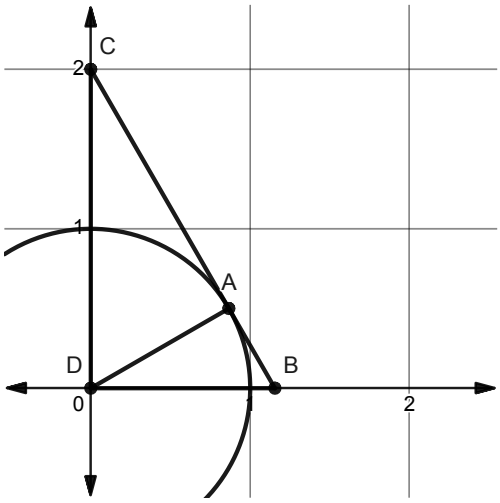
10. Simplify the expression $\dfrac{\sec^2 x - 1}{\sec^2 x} + 1 - \sin^2 x.$

11. Use the diagram to answer the following questions. Let $m\angle ADB = \theta$.

a. Which segment represents $\csc\theta$?

b. Find the value of θ. How do you know?

c. Find AB.



12. Solve $-\cot^2\mu + 2\csc^2\mu = 5$ for $0 \le \mu \le 2\pi$.