Chapter 6 Hand-in Assignment – Trigonometric Identities

Name: _____

1. Simplify each expression.

a) $\dfrac{\tan x}{\sec x}$

b) $\dfrac{1}{\tan x \csc x}$

c) $\dfrac{1-\cot x}{\tan x - 1}$

d) $\dfrac{1+\cot^2 x}{\cot^2 x}$

e) $\sec x \cos x + \dfrac{\cos^2 x}{\sin^2 x}$

f) $\dfrac{1}{\sec^2 x} + \dfrac{1}{\csc^2 x}$

2. Verify the following identity algebraically, for $x = \frac{\pi}{4}$

$$\frac{1-\sin x}{\cos x} = \frac{\cos x}{1+\sin x}$$

3. Write each expression as a single trigonometric function.

a) $\cos 20^\circ \cos 5^\circ + \sin 20^\circ \sin 5^\circ$

b) $2\cos^2\left(\frac{\pi}{5}\right) - 1$

c) $2\sin 7x \cos 7x$

4. Use identities and special angle values to determine the exact value of each trigonometric expression.

a) $\cos 195^\circ$

b) $\sin 255^\circ$

5. If $\angle$A is in quadrant I, $\angle$B is in quadrant III, and $\sin A = \frac{7}{25}$ and $\cos B = -\frac{8}{17}$, use identities to evaluate each of the following:

   a) $\sin(A - B)$

   b) $\cos 2B$

   c) $\sin 2A$

6. Prove the following identities:

a) $\dfrac{1+\cos 2x}{\sin 2x} = \cot x$

b) $\dfrac{1-\sin^2 x - 2\cos x}{\cos^2 x - \cos x - 2} = \dfrac{1}{1+\sec x}$

c) $\dfrac{\csc x + \cot x}{\tan x + \sin x} = \cot x \csc x$

d) $\sec x + \tan x = \dfrac{\cos x}{1 - \sin x}$

7. Solve each equation algebraically, over the given domain. You will need to use identities!

a) $\sin 2x + \cos x = 0$, for $0^\circ \le x < 360^\circ$.

b) $\sin^2 x = \cos x - \cos 2x$, for $0 \le x < 2\pi$