Name: _____ Date: _____

Chapter 6 Review

For each type of question, the achievement level is indicated. Showing work is an important strategy in communicating your knowledge and ideas so please be thorough.

Learning Goal 6.1	Using identities to reduce complexity in expressions and solve equations.

Developing		
1. Find the values of the following expressions without the use of a calculator.		
a. $\cos\left(\frac{\pi}{2}+x\right)+\sin x$	b. $\sin\left(\frac{3\pi}{4}\right)$	c. $\cos\left(\frac{5\pi}{3}\right)$
d. $\sin\left(\frac{5\pi}{6}\right)$	e. $\cos\left(\frac{11\pi}{6}\right)$	f. $\sin\left(\frac{9\pi}{4}\right)$

Proficient
2. Determine the exact value of $\sec x$ if $\sin\left(\frac{\pi}{2}-x\right)=\frac{3}{4}$ if x is in QI.
3. Determine the exact value of $\cos x$ if $\cos\left(\frac{3\pi}{2}+x\right)=\frac{2}{3}$ if x is in QII.
4. Determine the exact value of $\cot x$ if $\cos(\pi+x)=\frac{1}{4}$ if x is in QIII.
5. Determine the exact value of $\csc x$ if $\sin\left(\frac{3\pi}{2}-x\right)=\frac{5}{9}$ if x is in QII.
6. Determine the exact value of $\sin 2x$ if $\sin x=\frac{2}{7}$ if x is in QII.
7. Determine the exact value of $\cos 2x$ if $\tan x=-\frac{5}{3}$ if x is in QII.
8. Determine the exact value of $\sin 2x$ if $\sec x=-\frac{5}{3}$ if x is in QIII.

Proficient	
9. Prove the identity.	
a. $\tan^2 x-\sin^2 x=\tan^2 x\sin^2 x$	b. $\frac{\sec x-\cos x}{\tan x}=\sin x$
c. $\frac{\cos x+\sin x\tan x}{\sin x\sec x}=\csc x$	d. $\frac{\csc x}{\tan x+\cot x}=\cos x$
e. $\sin x+\cos x\cot x=\csc x$	f. $\csc^2 x+\sec^2 x=\csc^2 x\sec^2 x$

Name: _____ Date: _____

Chapter 6 Review

Extending	
g. $\dfrac{\cot x}{\csc x - 1} = \dfrac{\csc x + 1}{\cot x}$	h. $\dfrac{\sin 2x}{2 - 2\cos^2 x} = \cot x$
i. $\dfrac{1 - \cos x}{\sin^2 x} = \dfrac{1}{1 + \cos x}$	j. $\dfrac{\sin 2x}{\cos x} + \dfrac{\cos 2x}{\sin x} = \csc x$
k. $\dfrac{1}{\sec x + \tan x} = \dfrac{1 - \sin x}{\cos x}$	l. $\dfrac{\sin x \cos x}{1 + \cos x} = \dfrac{1 - \cos x}{\tan x}$
m. $\dfrac{\cos 2x}{\sin x} = \dfrac{\cot^2 x - 1}{\csc x}$	n. $\dfrac{\cot x - 1}{1 - \tan x} = \dfrac{\csc x}{\sec x}$
o. $(1 - \sin x)(\sec x + \tan x) = \dfrac{1}{\sec x}$	p. $\sin 2x\,(\tan x + \cot x) = 2$
q. $\dfrac{\cot x}{\sin x \csc x} = -\sec x$	r. $\dfrac{\sin 2x}{1 + \cos 2x} = \dfrac{\sec^2 x - 1}{\tan x}$
s. $\dfrac{2\cos x + 2\cos^2 x}{\sin 2x} = \dfrac{\sin x}{1 - \cos x}$	t. $\dfrac{1}{1 + \sin x} = \sec^2 x - \dfrac{\tan x}{\cos x}$
u. $\dfrac{\sin x + \tan x}{1 + \cos x} = \dfrac{\sin 2x}{2\cos^2 x}$	

Extending	
10. Solve each equation algebraically over the domain $0 \le x < 2\pi$.	
a. $2\cos^2 x - \cos x - 1 = 0$	b. $2\sin^2 x - 7\sin x + 3 = 0$
c. $2\sin x = 3 + 2\csc x$	d. $4\tan x + \cot x = 5$
e. $\sin 2x + 2\sin^2 x = 0$	f. $\sin x = \cos 2x$
g. $2\sin 2x = 3\cos x$	