

# 5.1

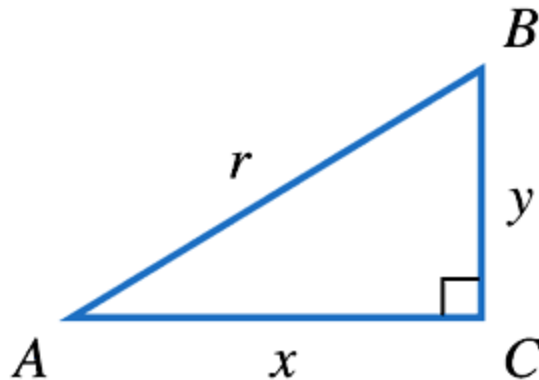
## Fundamental Identities

# Pythagorean Identities

$$\cos^2 \theta + \sin^2 \theta = 1$$

$$1 + \tan^2 \theta = \sec^2 \theta$$

$$\cot^2 \theta + 1 = \csc^2 \theta$$



# Cofunction Identities

$$\sin\left(\frac{\pi}{2} - \theta\right) = \cos \theta$$

$$\cos\left(\frac{\pi}{2} - \theta\right) = \sin \theta$$

$$\tan\left(\frac{\pi}{2} - \theta\right) = \cot \theta$$

$$\cot\left(\frac{\pi}{2} - \theta\right) = \tan \theta$$

$$\sec\left(\frac{\pi}{2} - \theta\right) = \csc \theta$$

$$\csc\left(\frac{\pi}{2} - \theta\right) = \sec \theta$$

# Even-Odd Identities

$$\sin(-x) = -\sin x$$

$$\cos(-x) = \cos x$$

$$\tan(-x) = -\tan x$$

$$\csc(-x) = -\csc x$$

$$\sec(-x) = \sec x$$

$$\cot(-x) = -\cot x$$

## EX: Simplifying by Factoring and Using Identities

Simplify the expression  $\cos^3 x + \cos x \sin^2 x$ .

# EX: Simplifying by Factoring and Using Identities

Factor  $\csc^2 x - \cot x - 3$

## EX: Simplifying by Expanding and Using Identities

Simplify the expression: 
$$\frac{(\csc x - 1)(\csc x + 1)}{\cos^2 x}$$

## EX: Simplifying by Adding and Using Identities

$$\frac{\sin \Theta}{1 + \cos \Theta} + \frac{\cos \Theta}{\sin \Theta}$$



# Class/Homework: pg. 451(1-50)

Turn in all odd problems before you  
leave today!

Evens are due at the beginning of  
class tomorrow!