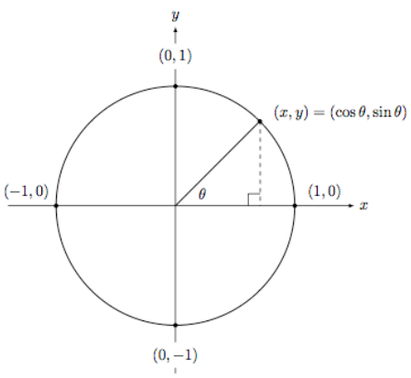
Name: _____ **Precalculus Unit 10, Lesson 1**

Aim: What are the fundamental trigonometric identities?

I. Do Now:
If $\sin\theta = \frac{2}{3}$ and θ terminates in Quadrant II, find the exact value of $\cos\theta$.

II. The Pythagorean Identities



III. The Reciprocal Identities

$\sin x = \frac{1}{\quad}$ $\quad\quad$ $\csc x = \frac{1}{\quad}$

$\cos x = \frac{1}{\quad}$ $\quad\quad$ $\sec x = \frac{1}{\quad}$

$\tan x = \frac{1}{\quad}$ $\quad\quad$ $\cot x = \frac{1}{\quad}$

IV. The Quotient Identities

$\tan x =$ _____

$\cot x =$ _____

Hints and Strategies for Proving Trigonometric Identities
1. Try to get one side to look identical to the other side.
2. Work on the more complicated side first.
3. Try to express everything in terms of $\sin x$ and $\cos x$
4. Do not cross-multiply or multiply both sides by the same quantity. (It is not an equation.)

V. Applications. Prove each identity. (Use a separate sheet, if necessary.)

1. $\cot x \cdot \sin x = \cos x$

2. $\frac{\tan x}{\sec x} = \frac{\cos x}{\cot x}$

3. $\tan x + \cot x = \csc x \cdot \sec x$

4. $\frac{2\cot x}{1+\cot^2 x} = 2\sin x \cos x$

5. $\frac{1-\sin x}{\cos^2 x} = \frac{1}{1+\sin x}$

6. $\cos^2 x - \sin^2 x = \frac{1-\tan^2 x}{1+\tan^2 x}$

HW24
- p. 362: 13, 17
- p. 355: 55, 56, 57, 58