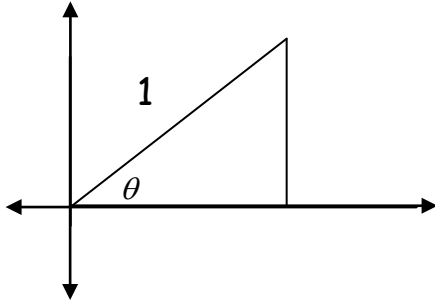# Pre-Calculus NOTES
Sections 4.2 and 4.3

Name: _____

You should have the handout titled "MEMORIZE OR PERISH" in front of you during these notes.

Now, we will start be explaining the Pythagorean identities. Please realize that $\sin^2 \theta = (\sin \theta)^2$.

	Where does $\sin^2 \theta + \cos^2 \theta = 1$ come from?
	Where does $\tan^2 \theta + 1 = \sec^2 \theta$ come from?
	Where does $\cot^2 \theta + 1 = \csc^2 \theta$ come from?

Example 1:   Verify the following Pythagorean identities for the give value of θ.

a. $\sin^2 \theta + \cos^2 \theta = 1$ for $\theta = 30°$	b. $\tan^2 \theta + 1 = \sec^2 \theta$ for $\theta = 45°$	c. $\cot^2 \theta + 1 = \csc^2 \theta$ for $\theta = 60°$

REMINDER: What does it mean to be a reciprocal?

The product of a number and it reciprocal will always equal _____.

Example 2:   Use definitions (x, y, and r) to prove each of the following. SHOW ALL STEPS.

a. Prove that $\csc\theta = \dfrac{1}{\sin\theta}$.	b. Prove that $\tan\theta = \dfrac{\sin\theta}{\cos\theta}$.
c. Prove that $\tan^2\theta + 1 = \sec^2\theta$.	d. Prove that $\sin^2\theta = 1 - \cos^2\theta$.