Integrated Math 3
Unit 4: Trig. Representations and Modeling
4.11

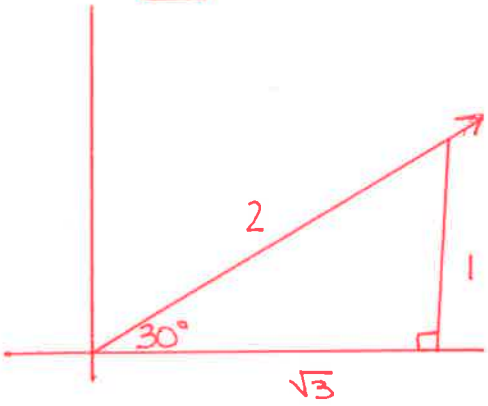
Name: _____

Date:_____ Period:_____

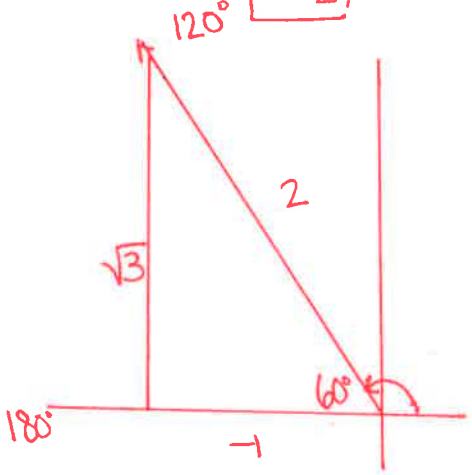
Objective: To evaluate trigonometric identities and quadrantals.

Warm Up: Evaluate each of the following:

$\sin(30°) =$ $\frac{1}{2}$



$\cos(120°) =$ $-\frac{1}{2}$

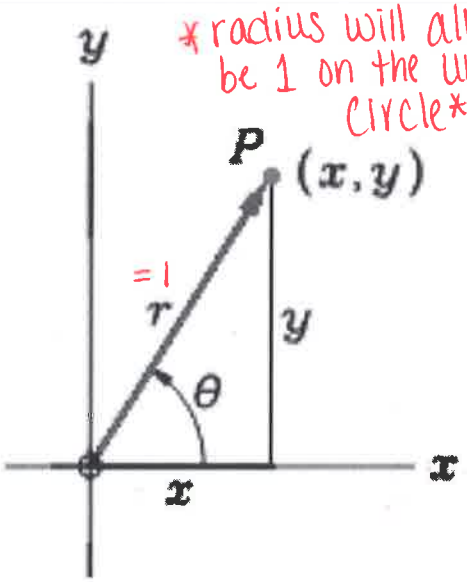


Trig Function Definitions:

$\sin\theta = \frac{y}{r} = \frac{y}{1} = y$

$\cos\theta = \frac{x}{r} = \frac{x}{1} = x$

$\tan\theta = \frac{y}{x}$



On the unit circle:

$(x, y) \rightarrow$ (Cosθ , Sinθ)

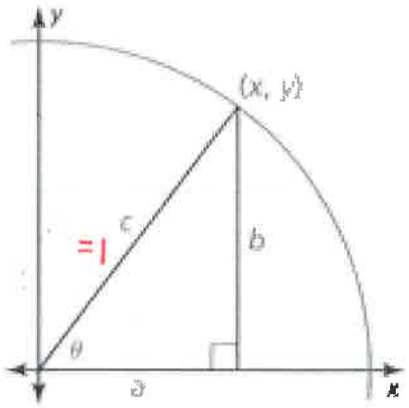
Quotient Identities:

$\tan\theta = \frac{\sin\theta}{\cos\theta}$

$\cot\theta = \frac{\cos\theta}{\sin\theta}$

Explore:

a) Using the diagram to the right, write an equation that relates a, b, and c.



$a^2 + b^2 = c^2$

b) Write expressions for the sine and cosine of θ.

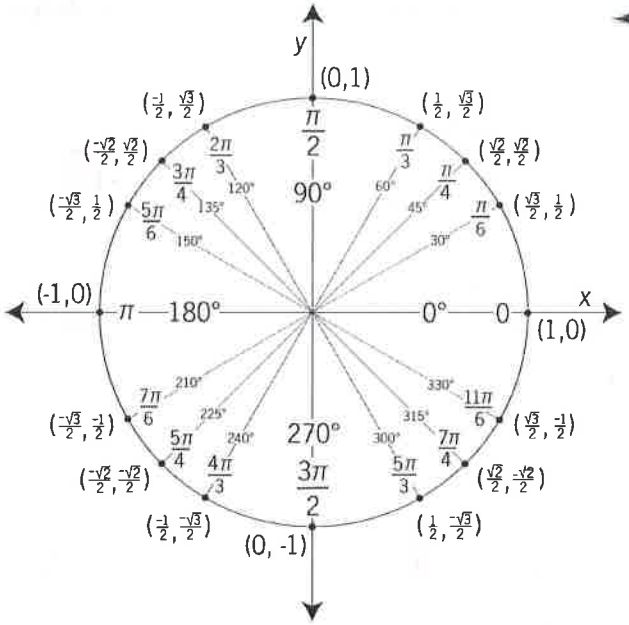
$\sin\theta = \frac{b}{c} = \frac{b}{1} = b$ $\quad \cos\theta = \frac{a}{c} = \frac{a}{1} = a$

c) Use your answers from parts a and b to find the sum of $\sin^2\theta$ and $\cos^2\theta$

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

$a^2 + b^2 = c^2$

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



d) Fill in the table.

θ	sin θ	$\sin^2\theta$	cos θ	$\cos^2\theta$	$\sin^2\theta + \cos^2\theta$
60°	$\frac{\sqrt{3}}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{3}{4} + \frac{1}{4} = \frac{4}{4} = 1$
210°	$-\frac{1}{2}$	$\frac{1}{4}$	$\frac{-\sqrt{3}}{2}$	$\frac{3}{4}$	$\frac{1}{4} + \frac{3}{4} = 1$

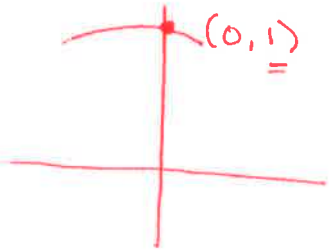
Vocabulary:

Quadrantal – when the angle we need to evaluate has a terminal side that falls on an axis

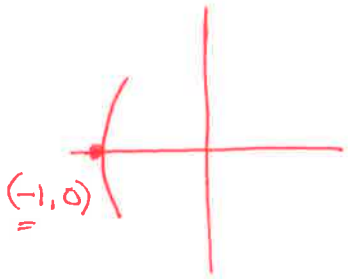
Example 2: Evaluate each of the following trigonometric functions.

* Can also use a calculator *

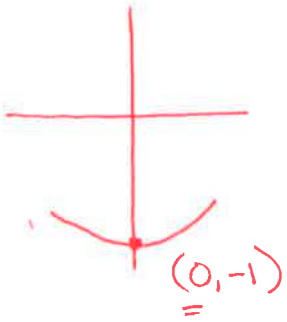
$\sin(90°) =$ 1



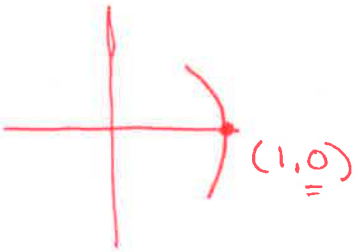
$\cos(180°) =$ −1



$\cos(270°) =$ 0

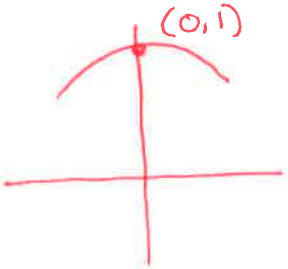


$\sin(0°) =$ 0



$\tan(90°) = \frac{1}{0}$ = undefined

Sin / Cos



$\tan(-180°) = \frac{0}{-1} = 0$