

Bell Activity:

1. Get AE 2. Fill in blanks below.

1. In any right triangle, $a^2 + b^2 =$ _____

2. $a(x + y) =$ _____

3. $x^2 - y^2 =$ _____

4. $(\sin \pi/6)^2 + (\cos \pi/6)^2 =$ _____

5. $(\sin \pi/2)^2 + (\cos \pi/2)^2 =$ _____ **AE**

(Put last answer in AE)

These are "identities"

7.1--Basic Trigonometric Identities

TRIG IDENTITY: an identity involving a **trig** expression

ex:

Algebraic Identity: $x^2 - y^2 = (x - y)(x + y)$

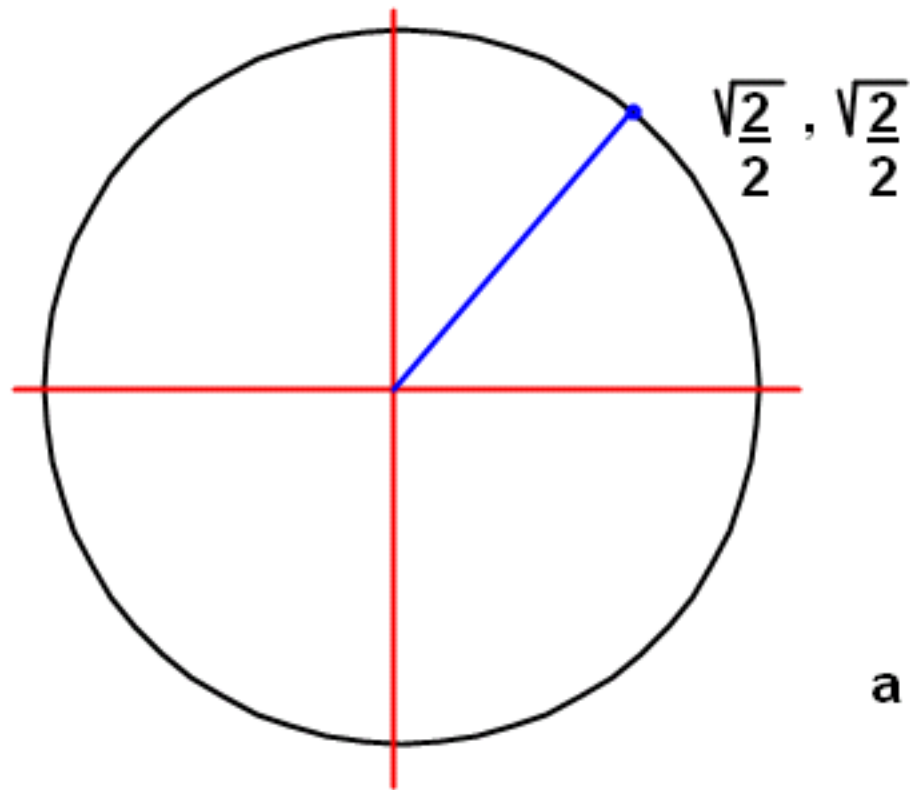
Trig Identity: $\cos x = \frac{1}{\sec x}$

There are many of both...we will study trig identities in this last chapter!

Another example: $\frac{\sin \theta}{\cos \theta} = \tan \theta$

This means that for any angle θ , if you \div $\sin \theta$ by $\cos \theta$ it will = $\tan \theta$

Consider the unit circle....the angle $\pi/4$. Find the sine and cosine and the tangent of $\pi/4$



$$\sin \pi/4 =$$

$$\cos \pi/4 =$$

$$\tan \pi/4 =$$

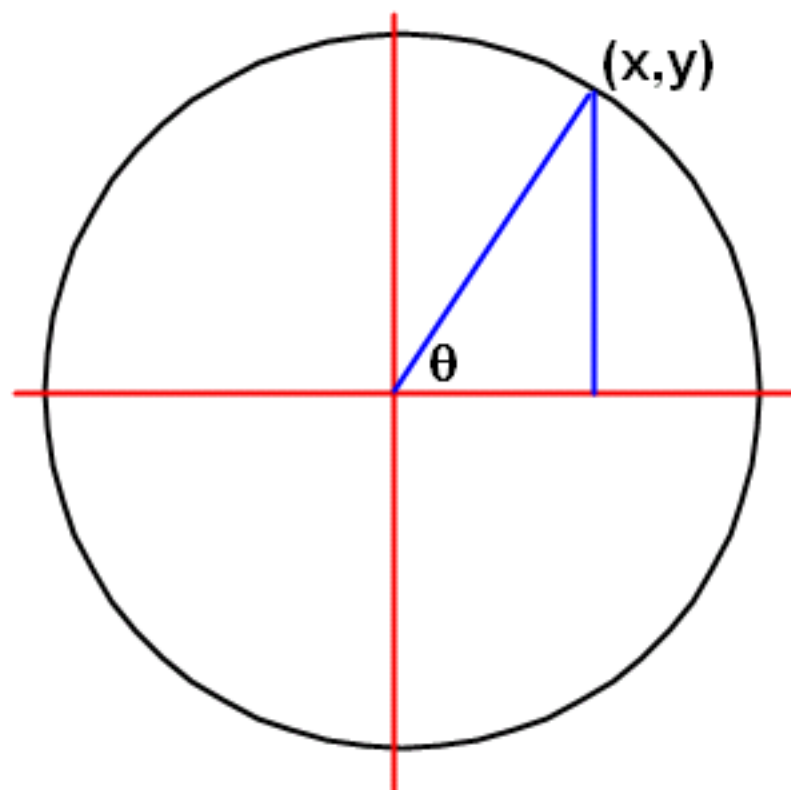
This works with **any** angle doesn't it?!

a **MAJOR** identity: $\frac{\sin x}{\cos x} = \tan x$

also **MAJOR** identity: $\frac{\cos x}{\sin x} = \cot x$

From the bell activity: $\sin^2\theta + \cos^2\theta = 1$no matter what θ value is

A "proof" of this identity using the **beloved** unit circle:



That's why $\sin^2\theta + \cos^2\theta = 1$ is called a "Pythagorean Identity"

And there are TWO more:

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

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

See page 422 and 423 for MORE trig identities!

NOW, how will we use these things?!

EX: If $\sec\theta = 3/2$, find $\cos\theta$.

EX: If $\csc\theta = 4/3$, find $\tan\theta$

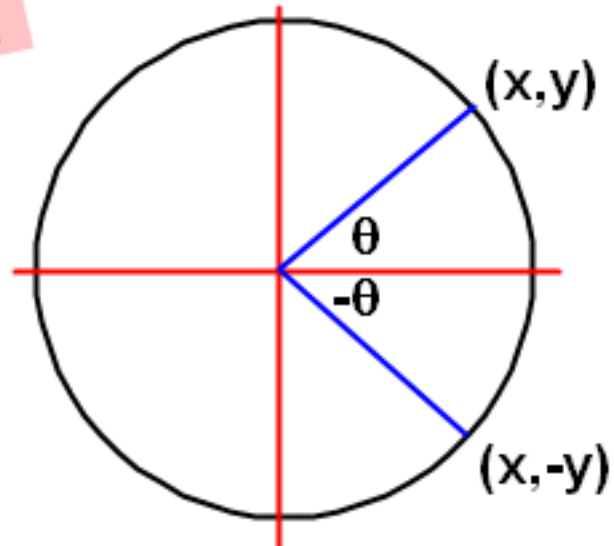
NOTE: In this chapter you MUST use trig identities....no triangles!

These 2 MIGHT come in handy some time: (Not MAJOR)

$$\sin(-\theta) = -\sin\theta$$

$$\cos(-\theta) = \cos\theta$$

WHY is this true?!



EX: If $\cos\theta = -3/5$, find $\csc\theta$ for $\pi \leq \theta \leq 3\pi/2$

EX: **Simplify:** $\sin x + \sin x \cdot \cot^2 x$

EX: **Simplify:** $\csc x - \cos x \cot x$

Simplify: $\cos^2 x \tan^2 x + \cos^2 x$



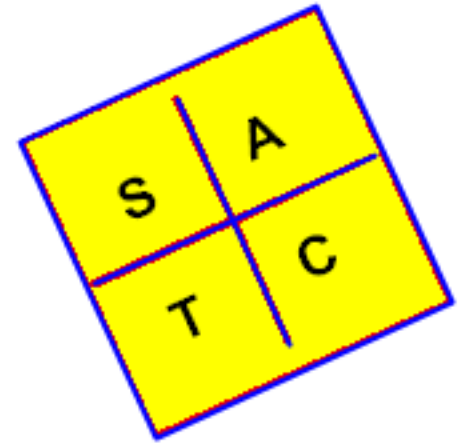
ex3 Express each value as a trig function of an angle in quadrant I

(A) $\sin 600^\circ$

(B) $\sin 19\pi/4$

(C) $\cos (-410^\circ)$

(D) $\tan(37\pi/6)$



STEPS to expressing trig values in QI:

(1) Identify which quadrant your function is in

(2) Find the reference angle

(3) Use

S	A
T	C

 to figure out the sign

UDO:

1. $\cos 490^\circ$

AE

2. $\sin(29\pi/6)$

3. $\tan(25\pi/4)$

AE

4. $\sin 930^\circ$