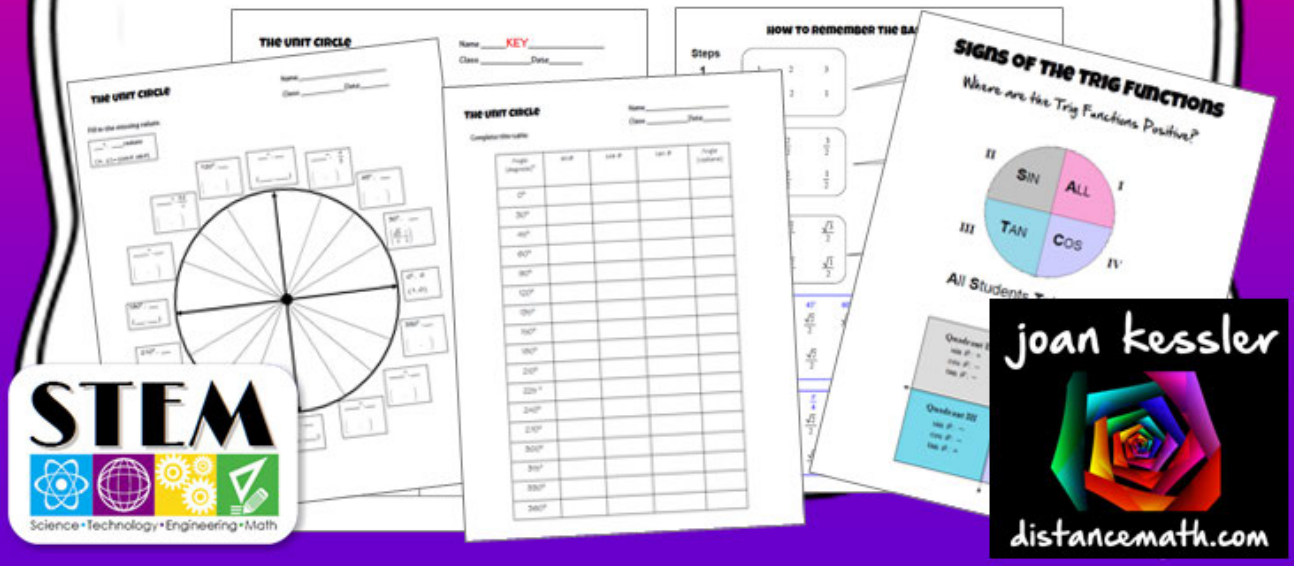
UNIT CIRCLE

Activity Bundle



STEM
Science • Technology • Engineering • Math

joan kessler
distancemath.com

Thank you for purchasing this product.

A Note For You

Please visit my store often to find high quality, innovative products for Calculus, PreCalculus, Trigonometry, Statistics, and Algebra. You will find PowerPoint Lessons, Task Cards, Games, Guided Notes, Interactive Notebook pages, Teach Interactive™ Google Slide and digital products, and so much more. I strive to create student centered., teacher friendly resources to implement into your classroom.

My store includes resources for Middle School, High School, College and Virtual Schools. Please email me at teachdydx@distancemath.com if you have any questions, comments, or requests.

Thank you for your support,

joan

Stay Connected

Terms of Use

Product Description

Unit Circle Resource

This resources is designed for Trigonometry but may be used in Geometry and PreCalculus. Having a good background and grasp of the basic Trig functions is invaluable in Calculus.

Included

*Three versions of the Unit Circle, one partially completed so that students can complete it, one with no information filled in (a template) , and one totally filled in. Very often I give pop quizzes with these. I may ask for just the first quadrant, or only the sine. I try to vary so that they don't memorize their way around the circle. It is strange to see a student in Calculus point their finger in a circle, while staring at the ceiling, just to find the sin of 7pi/6. There are lots of ways to vary these Unit circles. You can also use the template to write in the negative angles, or angles more than 2 pi.

*A table for students to fill in the values of the sine, cosine, and tangent for the important angles.

*A worksheet with questions about the values of the sine and cosine as the values move around the unit circle

*A quiz or HW assignment.

*A fabulous handout showing the students the BEST EVER method for remembering the values of 30 45 60. My students use this no matter what course they are in. As easy as 1 - 2 - 3!

* An innovative reference handout showing the students how to remember the signs of the trig functions.

* All answer keys

joan kessler

distancemath.com

The Unit Circle

Name_____

Class _____Date_____

Fill in the missing values.

___°, ____radians

$(x, y) = (\cos\theta, \sin\theta)$

120°, ___

(,)

___°, ___

(____, ____)

____°, $\frac{\pi}{3}$

(,)

____°, $\frac{3\pi}{4}$

(,)

45°, ___

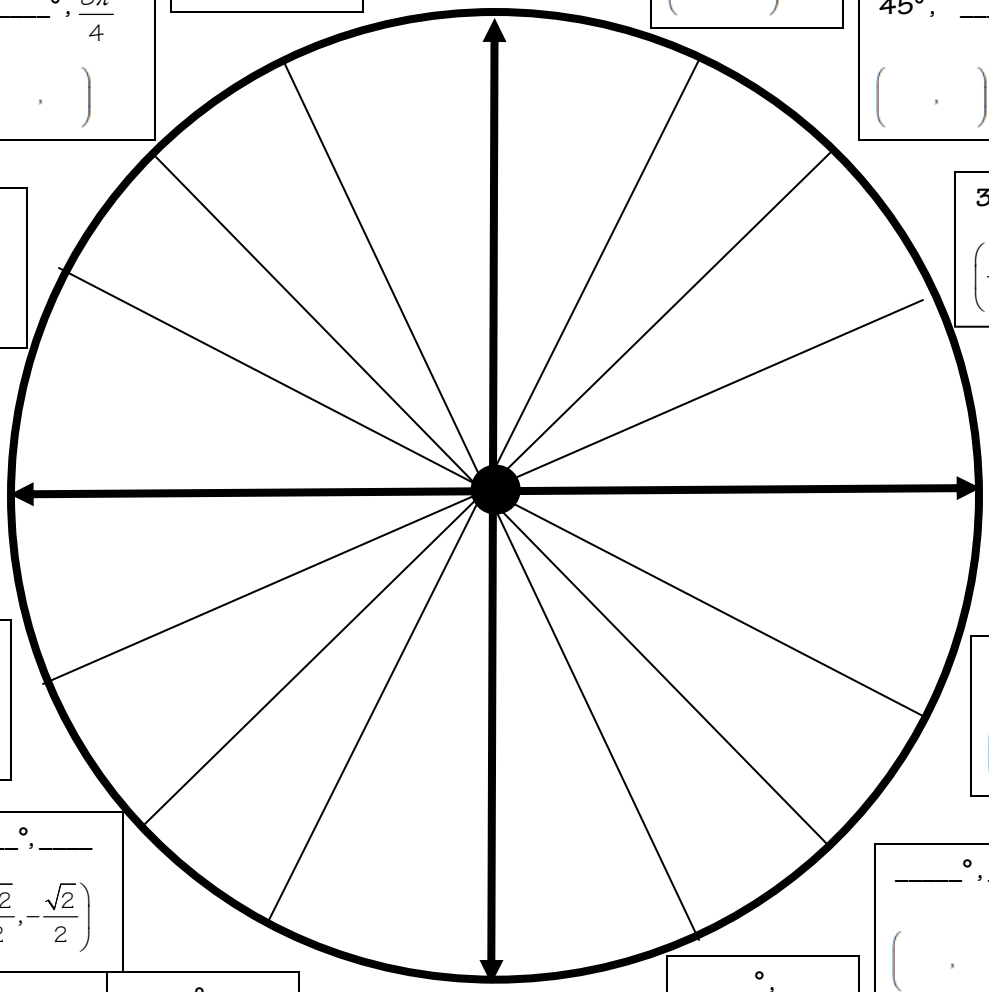
(,)

____°, ___

(,)

30°, ___

$\left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$



180°, ___

(___, ___)

0°, 0

(1, 0)

210°, ___

(,)

330°, ___

(,)

____°, ____

$\left(-\frac{\sqrt{2}}{2}, -\frac{\sqrt{2}}{2}\right)$

____°, ___

(,)

____°, ___

(,)

270°, ___

(____, ____)

____°, ___

(,)

The Unit Circle

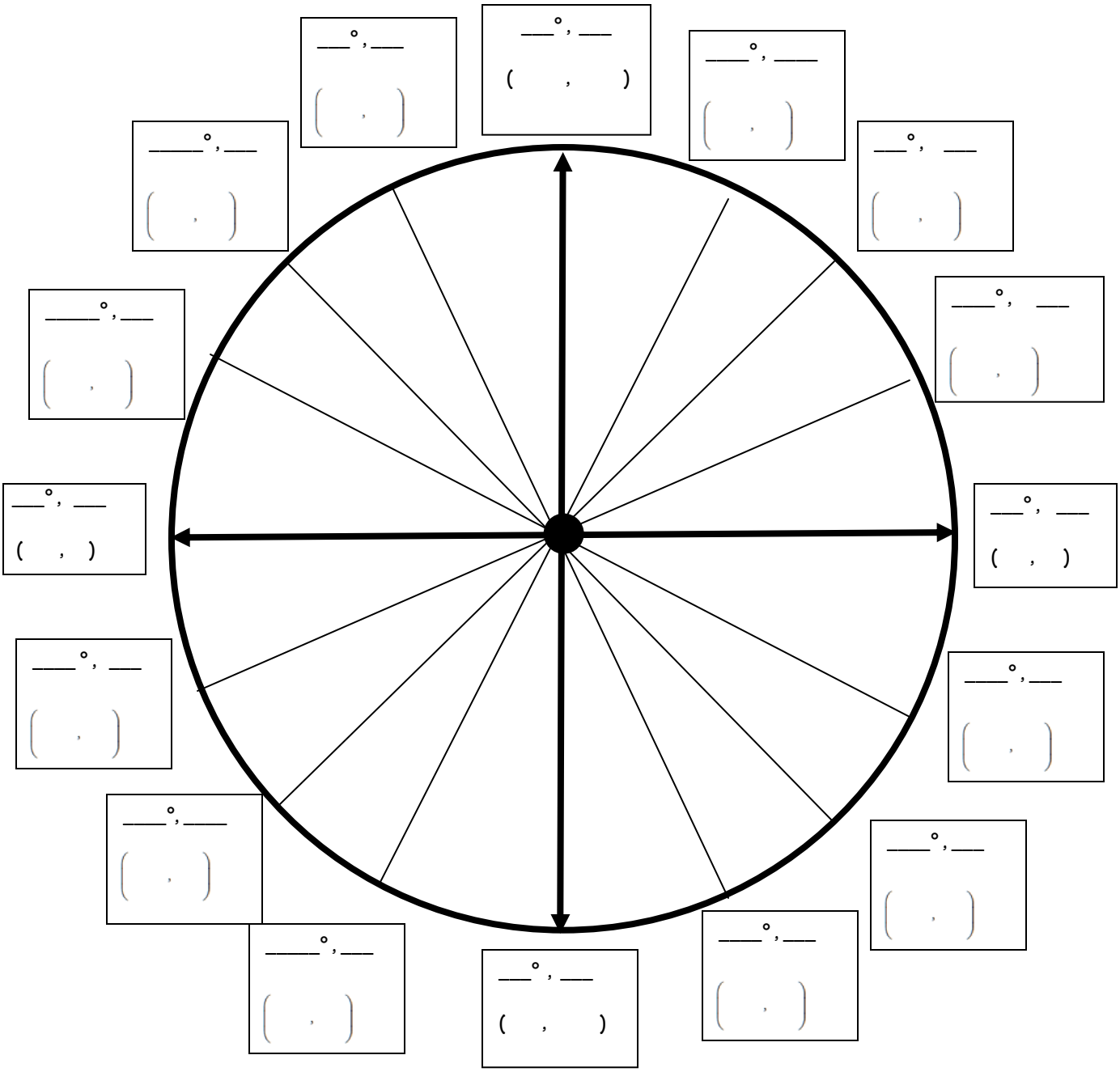
Name_____

Class_____Date_____

Fill in the missing values.

___°, ____radians

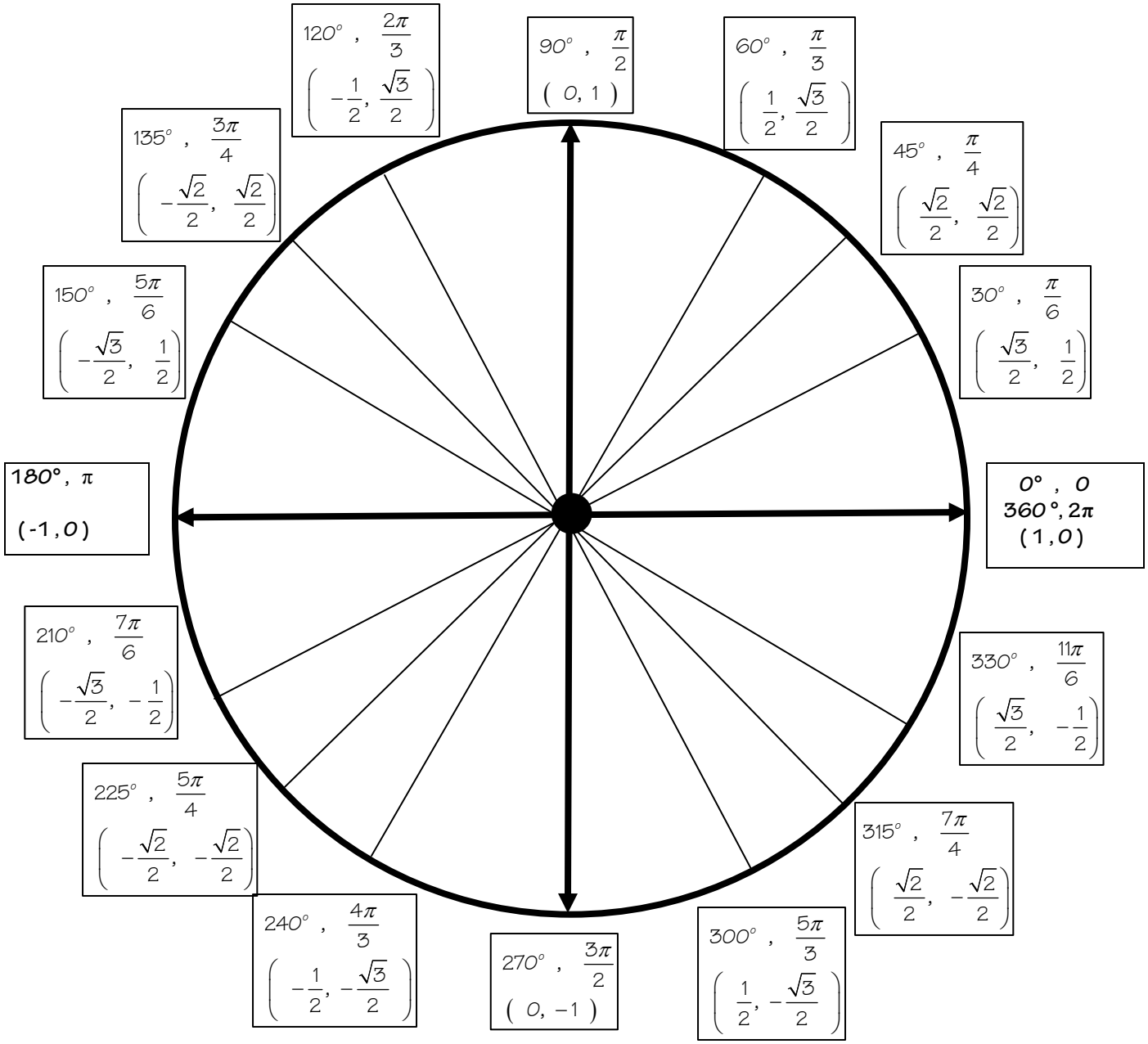
$(x, y) = (\cos\theta, \sin\theta)$



The Unit Circle

Name_____

Class _____Date _____



The Unit Circle

Name_____

Class _____Date_____

Complete this table:

Angle (degrees)°	sinθ	cos θ	tan θ	Angle (radians)
0°				
30°				
45°				
60°				
90°				
120°				
135°				
150°				
180°				
210°				
225 °				
240°				
270°				
300°				
315°				
330°				
360°				

The Unit Circle

Name _____KEY_____

Class _____Date_____

Complete this table:

Angle (degrees)°	sinθ	cos θ	tan θ	Angle (radians)
0°	0	1	0	0
30°	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	$\pi/6$
45°	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	1	$\pi/4$
60°	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$	$\pi/3$
90°	1	0	undef	$\pi/2$
120°	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$	$2\pi/3$
135°	$\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	-1	$3\pi/4$
150°	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$	$5\pi/6$
180°	0	-1	0	π
210°	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$\frac{\sqrt{3}}{3}$	$7\pi/6$
225°	$-\frac{\sqrt{2}}{2}$	$-\frac{\sqrt{2}}{2}$	1	$5\pi/4$
240°	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$\sqrt{3}$	$4\pi/3$
270°	-1	0	undef	$3\pi/2$
300°	$-\frac{1}{2}$	$\frac{1}{2}$	$-\sqrt{3}$	$5\pi/3$
315 °	$-\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$	-1	$7\pi/4$
330°	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{\sqrt{3}}{3}$	$11\pi/6$
360°	0	1	0	2π

The Unit Circle

Name_____

Class _____Date_____

Use the table and the Unit Circle to help answer these questions about the sine and the cosine:

1. The maximum value of the sin θ is: _____ . It occurs at what angle ? _____ .

2. The minimum value of the sin θ is: _____ . It occurs at what angle ? _____ .

3. As the angle θ goes from 0° to 90° the value of the sinθ goes from _____ to _____ .

4. As the angle θ goes from 90° to 180° the value of the sinθ goes from _____ to _____ .

5. As the angle θ goes from 180° to 270° the value of the sinθ goes from _____ to _____ .

6. As the angle θ goes from 270° to 360° the value of the sinθ goes from _____ to _____ .

7. The maximum value of the cosθ is: _____ . It occurs at what angle ? _____ .

8. The minimum value of the cosθ is: _____ . It occurs at what angle ? _____ .

9. As the angle θ goes from 0° to 90° the value of the cosθ goes from _____ to _____ .

10. As the angle θ goes from 90° to 180° the value of the cosθ goes from _____ to _____ .

11. As the angle θ goes from 180° to 270° the value of the cosθ goes from _____ to _____ .

12. As the angle θ goes from 270° to 360° the value of the cosθ goes from _____ to _____ .

The Unit Circle

Name_____ KEY_____

Class _____Date_____

Use the table and the Unit Circle to help answer these questions about the sine and the cosine:

1. The maximum value of the sin θ is: ____1____ . It occurs at what angle ? ____90°_____ .

2. The minimum value of the sin θ is: ____ -1 _____ . It occurs at what angle ? ___270°_____ .

3. As the angle θ goes from 0° to 90° the value of the sinθ goes from ___0_____ to __1_____ .

4. As the angle θ goes from 90° to 180° the value of the sinθ goes from __1_____ to ____ 0 ____ .

5. As the angle θ goes from 180° to 270° the value of the sinθ goes from ___ 0_____ to ___ -1_____ .

6. As the angle θ goes from 270° to 360° the value of the sinθ goes from ___-1 ____ to ____ 0 ____ .

7. The maximum value of the cosθ is: ___ 1 _____ . It occurs at what angle ? ____0°_____ .

8. The minimum value of the cosθ is: ____ -1_____ . It occurs at what angle ? ____180°_____ .

9. As the angle θ goes from 0° to 90° the value of the cosθ goes from __1_____ to ____ 0 ____ .

10. As the angle θ goes from 90° to 180° the value of the cosθ goes from ___ 0_____ to ___ -1_____ .

11. As the angle θ goes from 180° to 270° the value of the cosθ goes from ___-1 ____ to ____ 0 ____ .

12. As the angle θ goes from 270° to 360° the value of the cosθ goes from ___0_____ to __1_____ .

How to Remember the Basics

Steps

1.

1	2	3
3	2	1

1, 2, 3,
3, 2, 1,

2.

$\frac{1}{2}$	$\frac{2}{2}$	$\frac{3}{2}$
$\frac{3}{2}$	$\frac{2}{2}$	$\frac{1}{2}$

over 2, over 2,
over 2, ...over 2

3.

$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$

square root, square
root, square root, ...
square root

4.

	30°	45°	60°
sin	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$

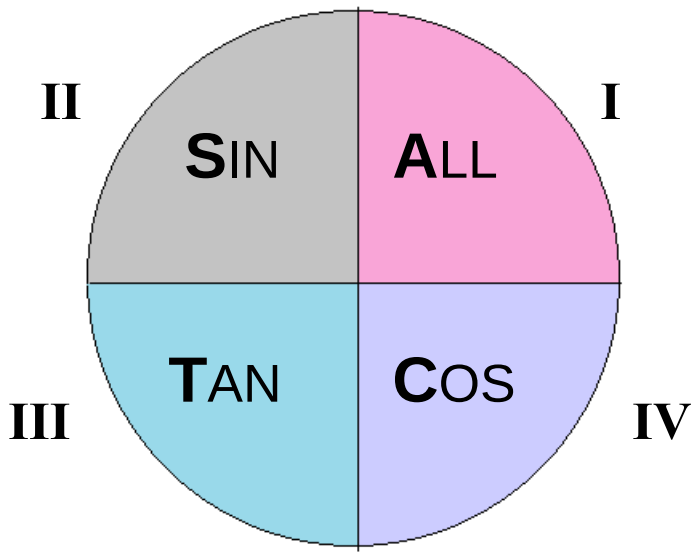
30, 45, 60,
sin, cos
Tahdah!!!!!!!!!!

	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$
sin	$\frac{\sqrt{1}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{1}}{2}$

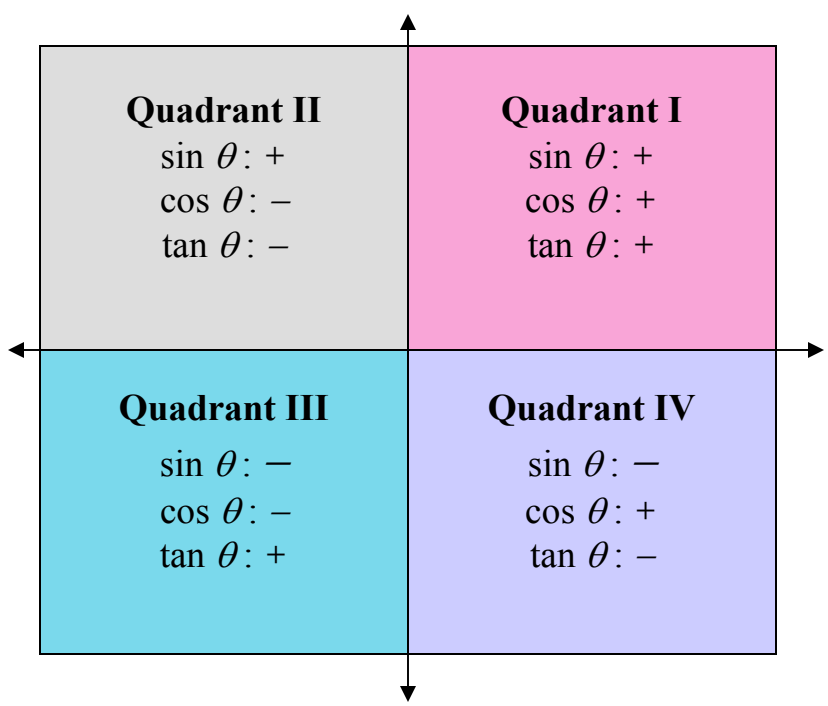
Wait, there's more.
Sine over cosine is tangent.....
denominators cancel..
Flip for csc, sec, cot
Signs for all quadrants
- **A**ll **S**tudents **T**ake **C**alculus

Signs of the Trig Functions

Where are the Trig Functions Positive?



All **S**tudents **T**ake **C**alculus



The Unit Circle

Name_____

Class_____Date_____

Find the exact value of the following expression without using a calculator.

1) $\sin \frac{5\pi}{3}$ 1) _____

2) $\tan \left(\frac{4\pi}{3}\right)$ 2) _____

3) $\cos 2\pi$ 3) _____

4) $\tan \left(\frac{\pi}{3}\right)$ 4) _____

5) $\cos \frac{5\pi}{6}$ 5) _____

6) $\sin (30^\circ)$ 6) _____

7) $\tan (45^\circ)$ 7) _____

8) $\sin \frac{5\pi}{6}$ 8) _____

9) $\tan(\pi/2)$ 9) _____

10) $\cos (60^\circ)$ 10) _____

11) $\cos \pi$ 11) _____

12) $\cos \frac{\pi}{6}$ 12) _____

Answer Key

UNIT CIRCLE HW QUIZ

1) $-\frac{\sqrt{3}}{2}$
2) $\sqrt{3}$
3) 1
4) $\sqrt{3}$
5) $-\frac{\sqrt{3}}{2}$
6) $\frac{1}{2}$
7) 1
8) $\frac{1}{2}$
9) Undefined
10) $\frac{1}{2}$
11) -1
12) $\frac{\sqrt{3}}{2}$

Signs of the Trig Functions

Name_____
Class_____Date_____

Name the quadrant in which the angle θ lies.

1) $\tan\theta > 0, \quad \sin\theta < 0$
A) I B) II C) III D) IV

2) $\cos\theta < 0, \quad \sin\theta < 0$
A) I B) II C) III D) IV

3) $\sin\theta > 0, \quad \cos\theta < 0$
A) I B) II C) III D) IV

4) $\tan\theta < 0, \quad \cos\theta > 0$
A) I B) II C) III D) IV

5) $\sin\theta > 0, \quad \cos\theta > 0$
A) I B) II C) III D) IV

6) $\cos\theta < 0, \quad \tan\theta < 0$
A) I B) II C) III D) IV

7) $\tan\theta < 0, \quad \sin\theta < 0$
A) I B) II C) III D) IV

8) $\cos\theta > 0, \quad \sin\theta < 0$
A) I B) II C) III D) IV

Answer Key

SIGNS OF TRIG FUNCTIONS

1) C
2) C
3) B
4) D
5) A
6) B
7) D
8) D