

Welcome Back MYP Math 9!

	Assignment Effort Grade (Circle One)	Comments (What was interesting or challenging?)
Monday Date: 12/11 Topic: Unit 3 test Friday - no HW!	0 1 2	
Tuesday Date: 12/12 Topic: 5AB Radicals	0 1 2	
Wednesday Date: 12/13 Topic: 5C Simplifying Radicals	0 1 2	
Thursday Date: 12/14 Topic: Special Right Triangles	0 1 2	
Friday Date: _____ Topic: _____	0 1 2	

Class Plan:

1. Warm-up, homework ??

2. Apply Special Right Triangles

A

THE UNIT CIRCLE

3. Practice

ADVISORY BELL SCHEDULE (w/3 lunches)

Lunch A		
1st Hour	8:05-8:48	43 minutes
2nd Hour	8:53-9:36	43 minutes
Advisory	9:41-10:25	44 minutes
3rd Hour	10:30-11:13	43 minutes
Lunch A	11:18-11:48	30 minutes
4th Hour (Late)	11:53-12:36	43 minutes
5th Hour (Late)	12:41-1:24	43 minutes
6th Hour	1:29-2:12	43 minutes
7th Hour	2:17-3:00	43 minutes

Lunch B		
1st Hour	8:05-8:48	43 minutes
2nd Hour	8:53-9:36	43 minutes
Advisory	9:41-10:25	44 minutes
3rd Hour	10:30-11:13	43 minutes
4th Hour (Early)	11:18-12:01	43 minutes
Lunch B	12:06-12:36	30 minutes
5th Hour (Late)	12:41-1:24	43 minutes
6th Hour	1:29-2:12	43 minutes
7th Hour	2:17-3:00	43 minutes

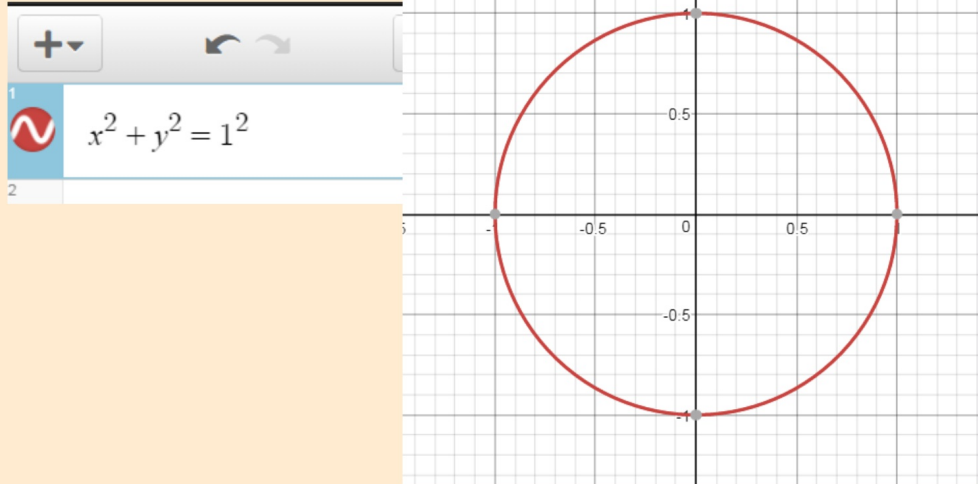
Lunch C		
1st Hour	8:05-8:48	43 minutes
2nd Hour	8:53-9:36	43 minutes
Advisory	9:41-10:25	44 minutes
3rd Hour	10:30-11:13	43 minutes
4th Hour (Early)	11:18-12:01	43 minutes
5th Hour (Early)	12:06-12:49	43 minutes
Lunch C	12:54-1:24	30 minutes
6th Hour	1:29-2:12	43 minutes
7th Hour	2:17-3:00	43 minutes

25A

THE UNIT CIRCLE

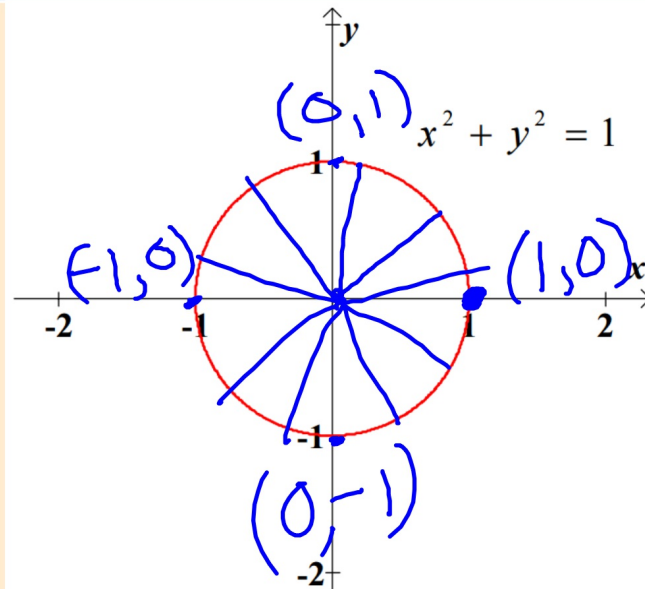
Warm-up:

Go to [Desmos.com](https://www.desmos.com) and graph a circle with a radius of 1 unit.



The Unit Circle

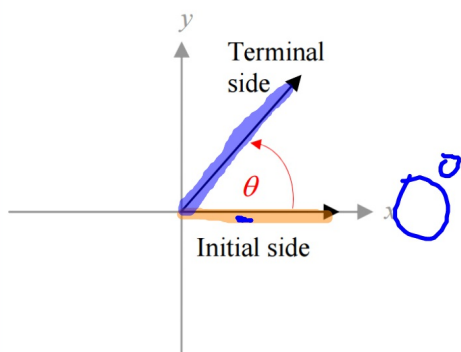
The circle of radius 1 unit with its centre at the origin O , is called the **unit circle**.



Standard Angle Position - start measuring degrees at positive x-axis.

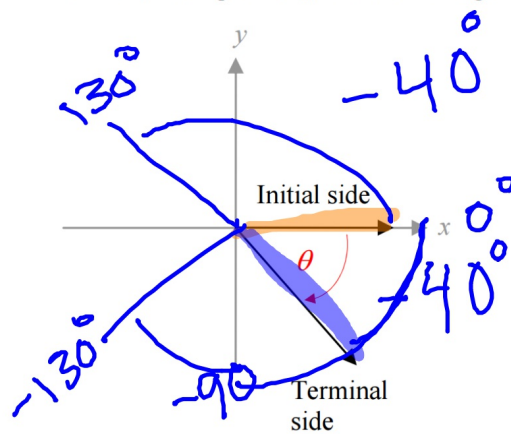
Counterclockwise →
Positive Angle
Measure

(into the positive quadrant)
 θ in standard position, where θ is positive:



Clockwise → down
Negative Angle
Measure

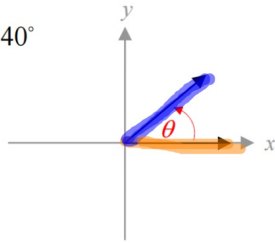
(into the negative quadrant)
 θ in standard position, where θ is negative:



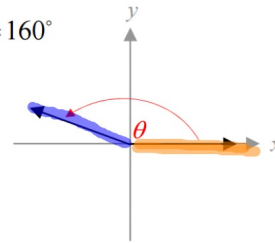
Examples

The following angles are drawn in standard position:

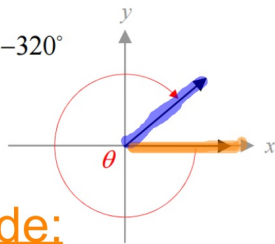
1. $\theta = 40^\circ$



2. $\theta = 160^\circ$



3. $\theta = -320^\circ$



Notice that the terminal sides in examples 1 and 3 are in the same position, but they do not represent the same angle (because the amount and direction of the rotation in each is different). Such angles are said to be coterminal.

Initial side:

The side of the angle from $(0,0)$ to $(1,0)$.

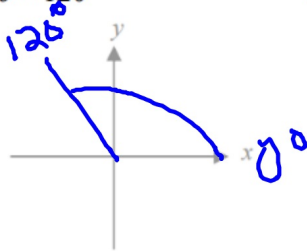
Terminal side

The "ending" side of the angle rotation.

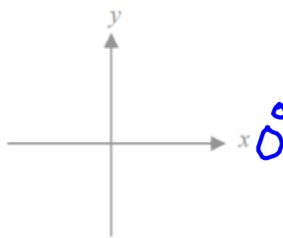
Practice:

Sketch the following angles in standard position.

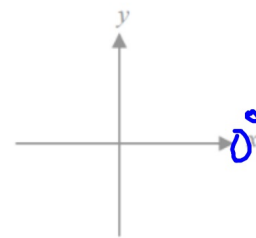
1. $\theta = 120^\circ$



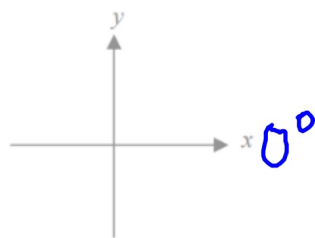
2. $\theta = -45^\circ$



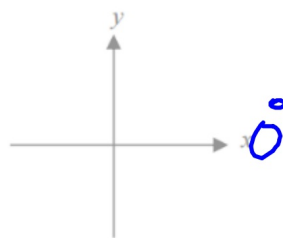
3. $\theta = -130^\circ$



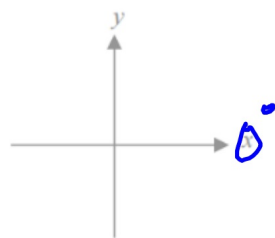
4. $\theta = 270^\circ$



$\theta = -90^\circ$



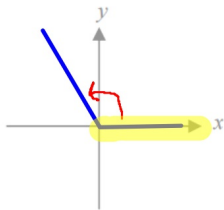
6. $\theta = 750^\circ$



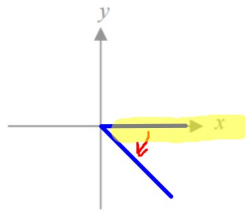
Answers

Sketch each of the following angles in standard position. (Do not use a protractor, just draw a brief sketch.)

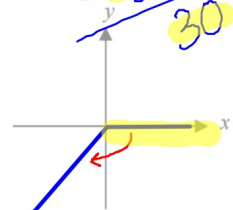
1. $\theta = 120^\circ$



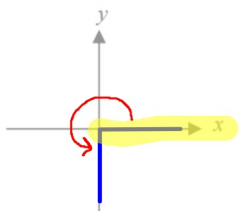
2. $\theta = -45^\circ$



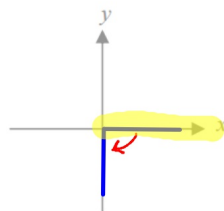
3. $\theta = -130^\circ$



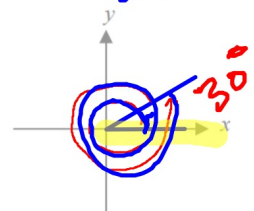
4. $\theta = 270^\circ$



$\theta = -90^\circ$



6. $\theta = 750^\circ$



Handwritten calculations for problem 3:
 750
 -360

 390
 -360

 30

Handwritten calculation for problem 6:
 $2 \times 360 = 720$

Handwritten calculation for problem 6:
 $750 - 720 = 30$

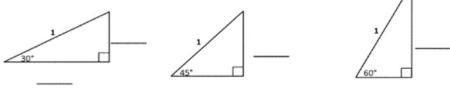
A

THE UNIT CIRCLE

Goal: Apply Special Right Triangles to find coordinates of all angles of 1st quadrant.

1) Do: parts 1 - 3.

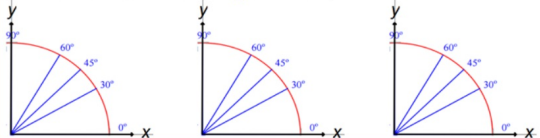
Unit Circle (25.6) Guided Notes
Use special right triangles to fill in the lengths of the missing sides. NO DECIMALS.



2) Use the side lengths of the special right triangles to find the trig ratios:

$\sin(30^\circ) =$	$\sin(60^\circ) =$	$\sin(45^\circ) =$
$\cos(30^\circ) =$	$\cos(60^\circ) =$	$\cos(45^\circ) =$

3) Draw these special right triangles onto the quadrant plane (30, 45, and 60 degrees)

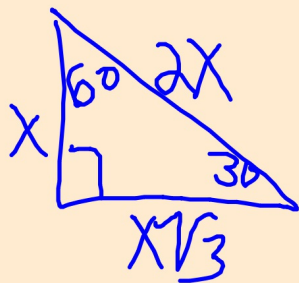
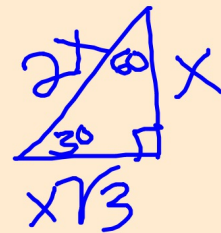
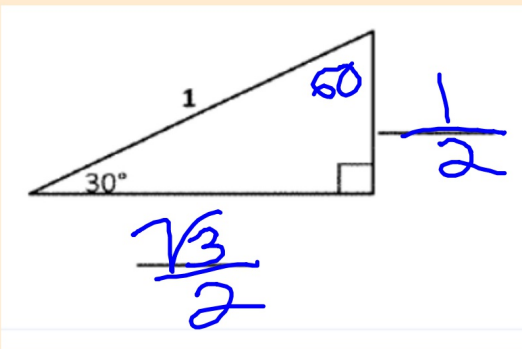


2) Use coordinates to find these:

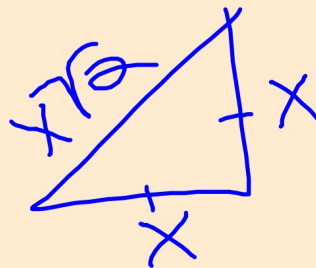
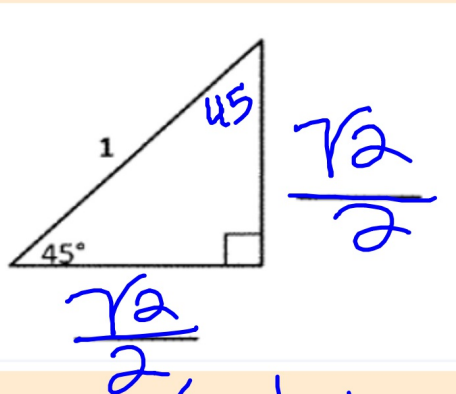
$\cos(0^\circ) =$	1
$\sin(0^\circ) =$	0
$\cos(90^\circ) =$	0
$\sin(90^\circ) =$	1
$\cos(360^\circ) =$	1

Done: Consider 2nd quadrant.

Use special right triangles to fill in the lengths of the missing sides. NO DECIMALS.

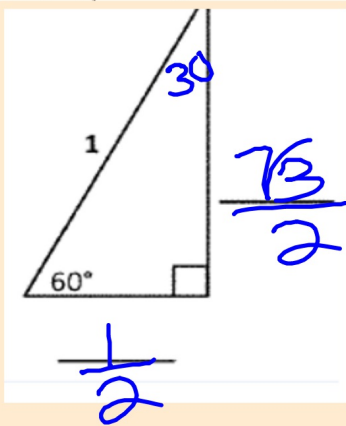


Use special right triangles to fill in the lengths of the missing sides. NO DECIMALS.



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

Use special right triangles to fill in the lengths of the missing sides. NO DECIMALS.



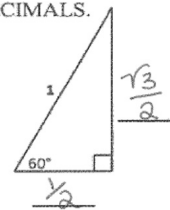
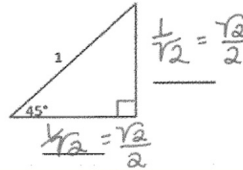
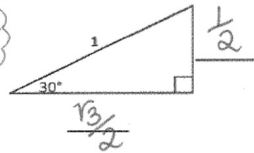
2) Use the side lengths of the special right triangles to find the trig ratios:

Unit Circle (25A) Guided Notes:

Use special right triangles to fill in the lengths of the missing sides. NO DECIMALS.

Note

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



$$\sin(30^\circ) = \frac{1}{2}$$

$$\sin(60^\circ) = \frac{\sqrt{3}}{2}$$

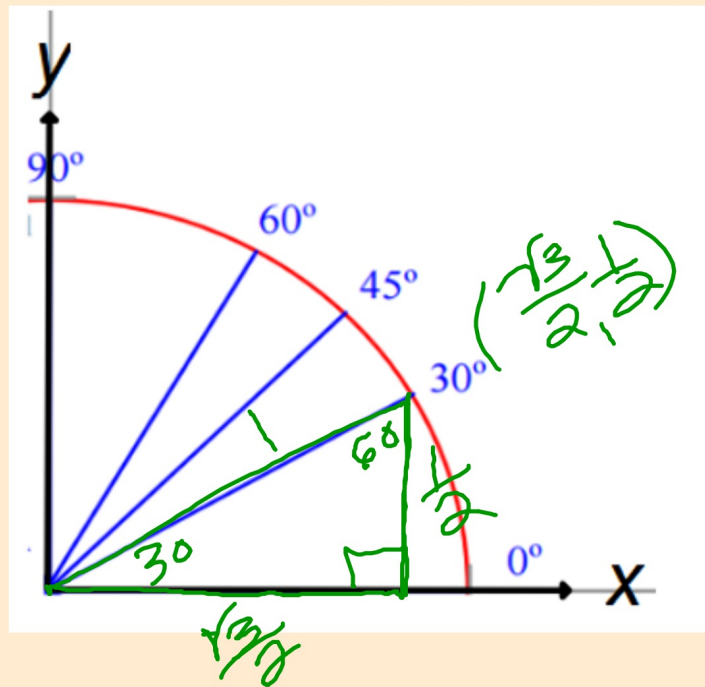
$$\sin(45^\circ) = \frac{\sqrt{2}}{2}$$

$$\cos(30^\circ) = \frac{\sqrt{3}}{2}$$

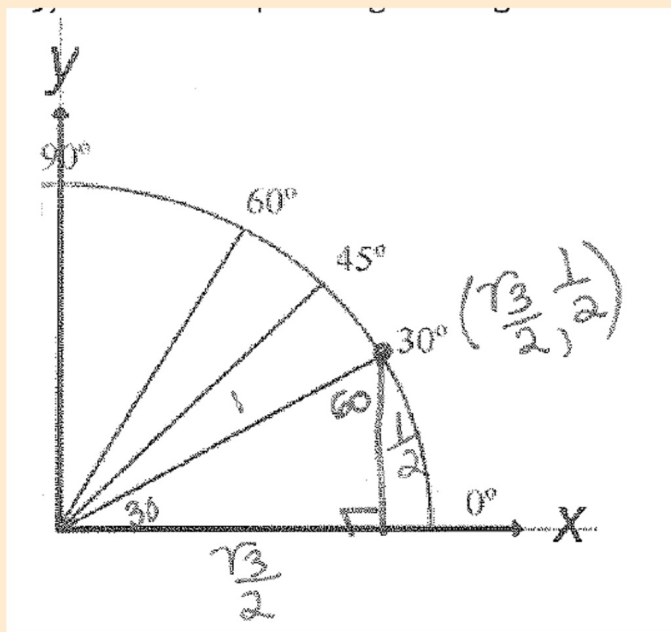
$$\cos(60^\circ) = \frac{1}{2}$$

$$\cos(45^\circ) = \frac{\sqrt{2}}{2}$$

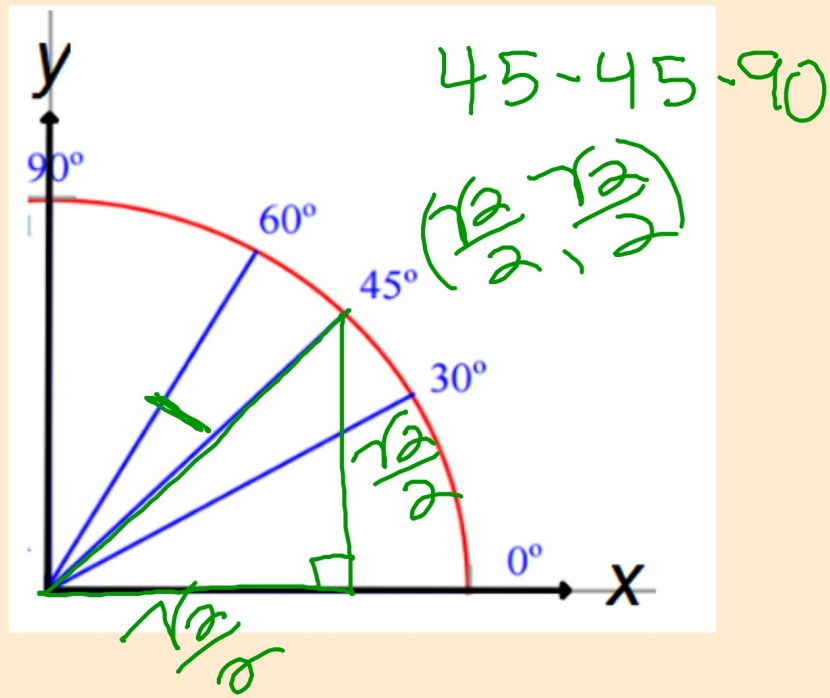
3) Draw these special right triangles onto the quadrant plane. (30, 45, and 60 degrees)



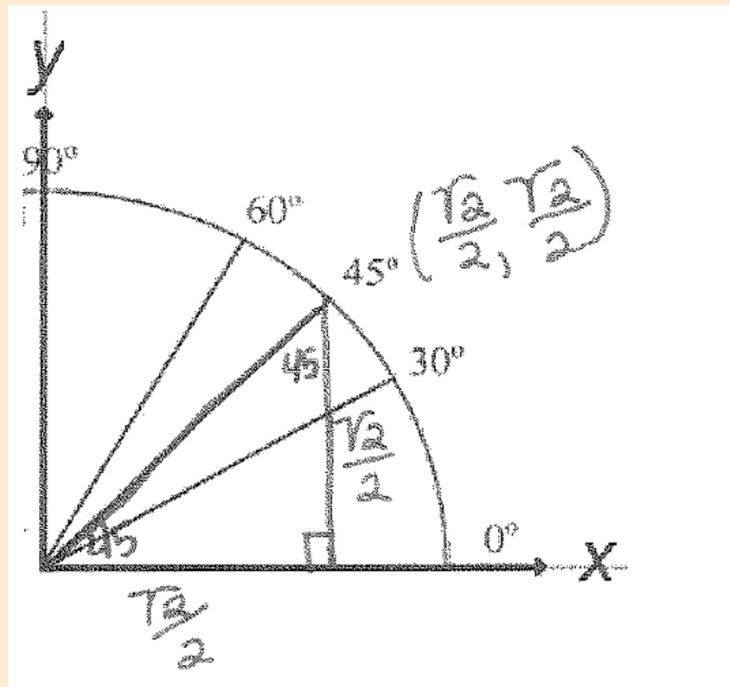
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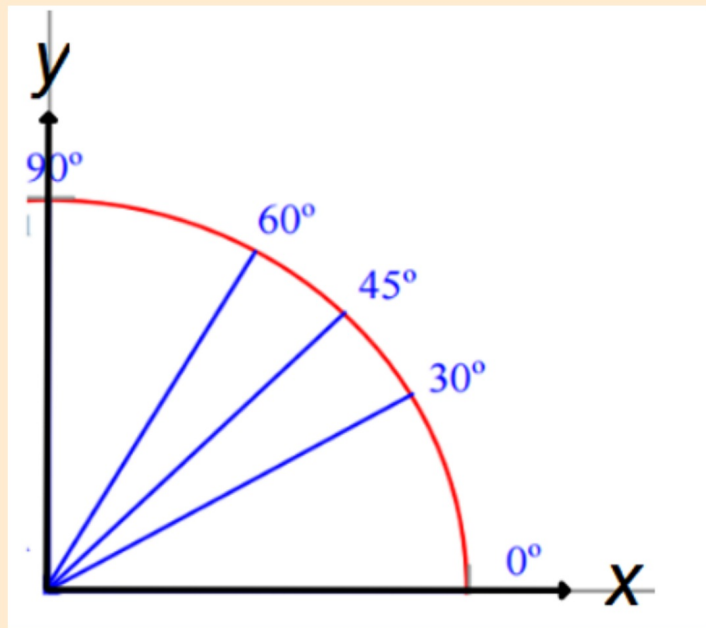
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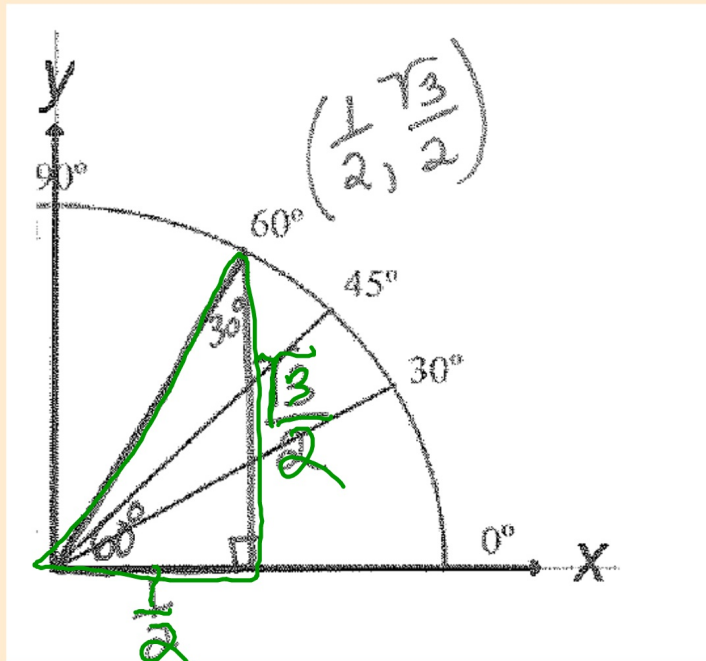
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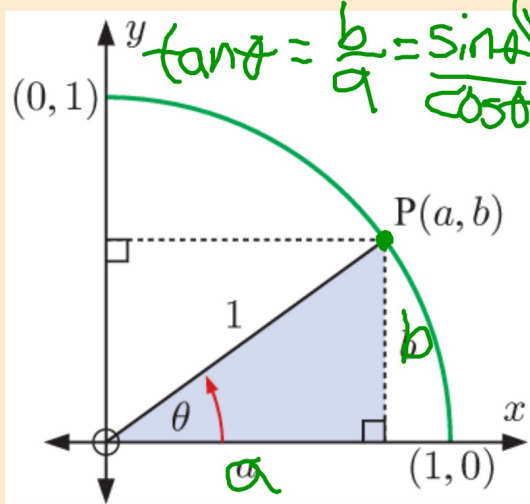
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3) Draw these special right triangles onto the quadrant plane. (30, 45, and 60 degrees)



Solve for a and b in terms of sine and cosine



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

$$\sin(\theta) = \frac{b}{1}$$

$$\cos(\theta) = \frac{a}{1}$$

$$a = \cos \theta$$

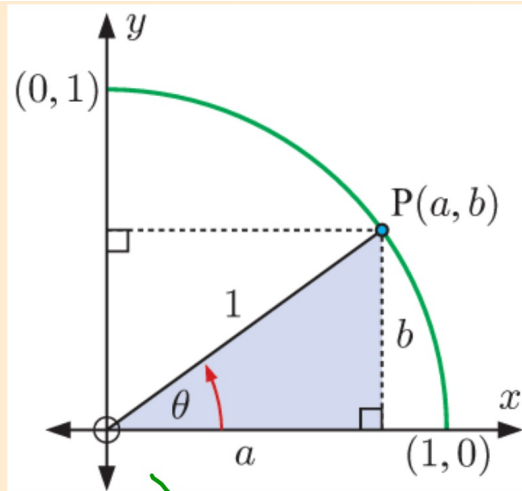
$$P(a,b) = (\cos \theta, \sin \theta)$$

$$\sin(\theta) = \frac{b}{1}$$

$$\Rightarrow b = \sin(\theta)$$

$$\cos(\theta) = \frac{a}{1}$$

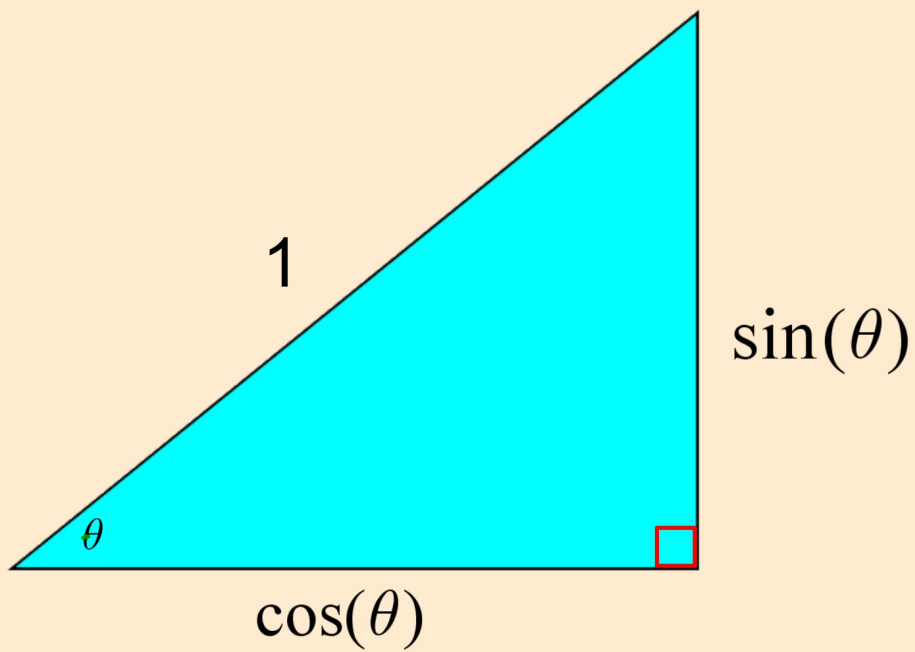
$$\Rightarrow a = \cos(\theta)$$



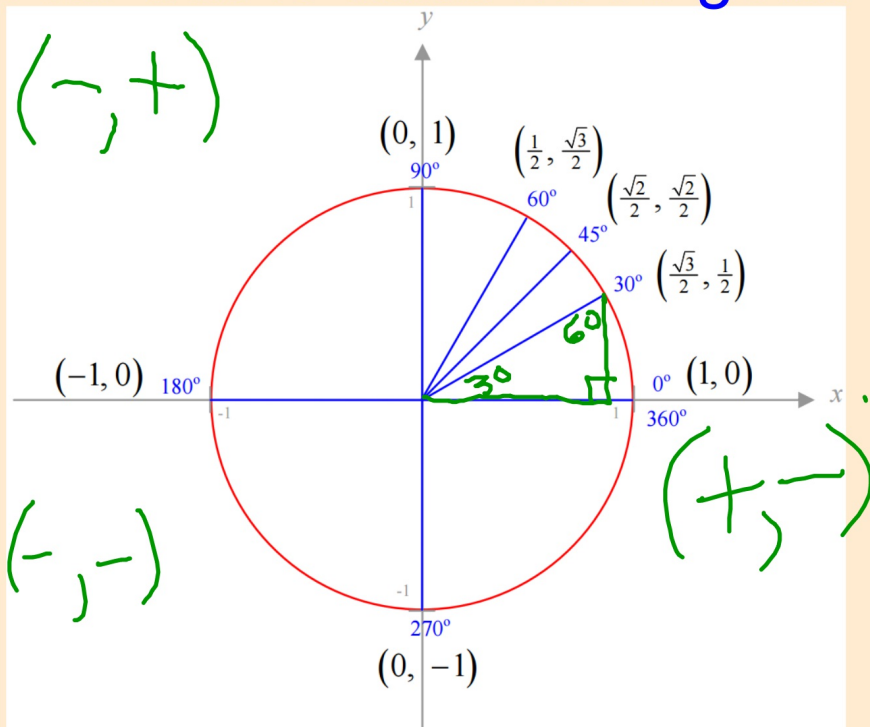
$$P = (\cos(\theta), \sin(\theta))$$



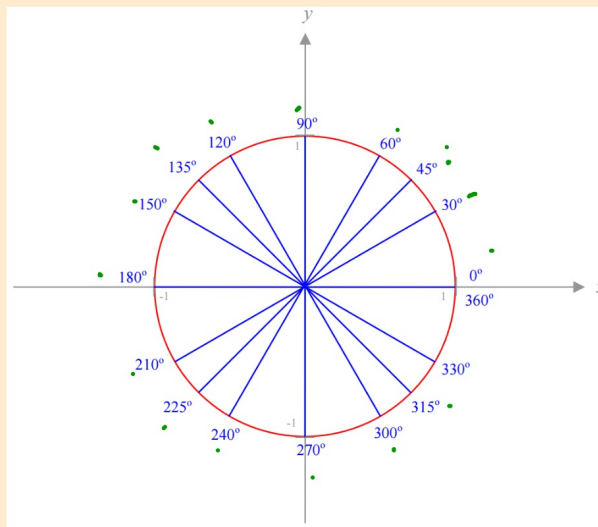
The Unit Triangle



So far this is what we've got...



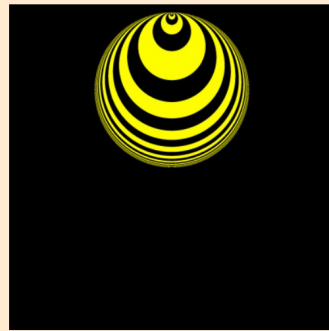
Our goal is to be able to find the coordinate pairs on the unit circle for all of these angles...



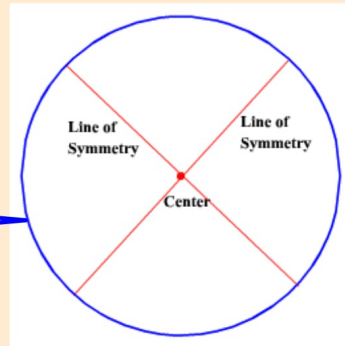
...without these:



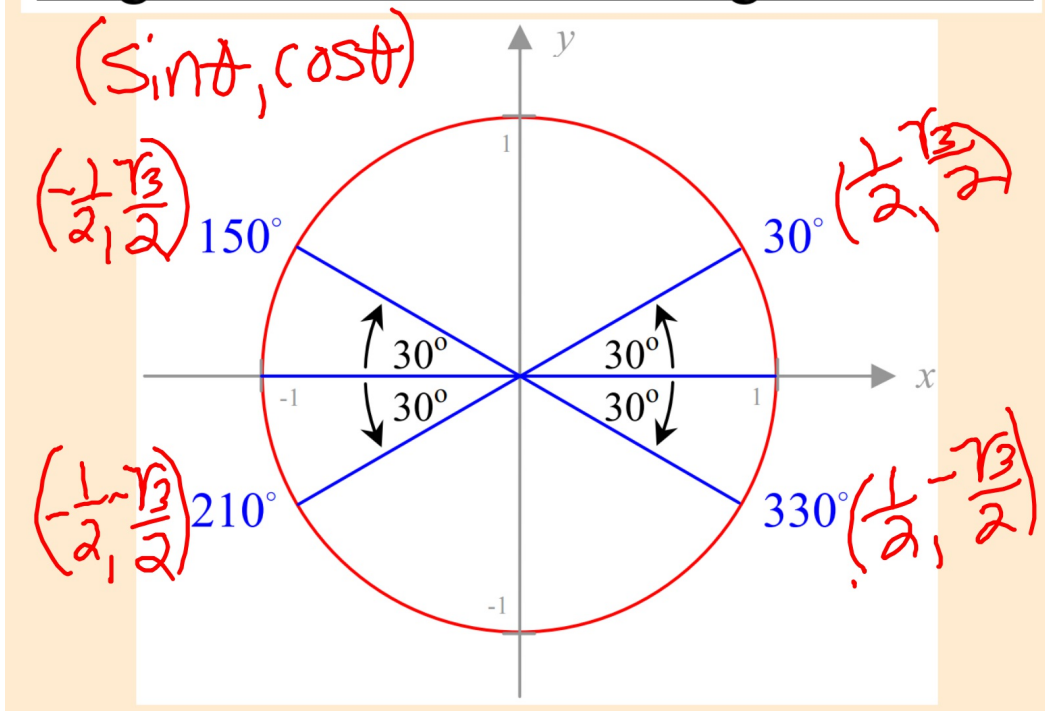
It honestly isn't that bad though, because of...



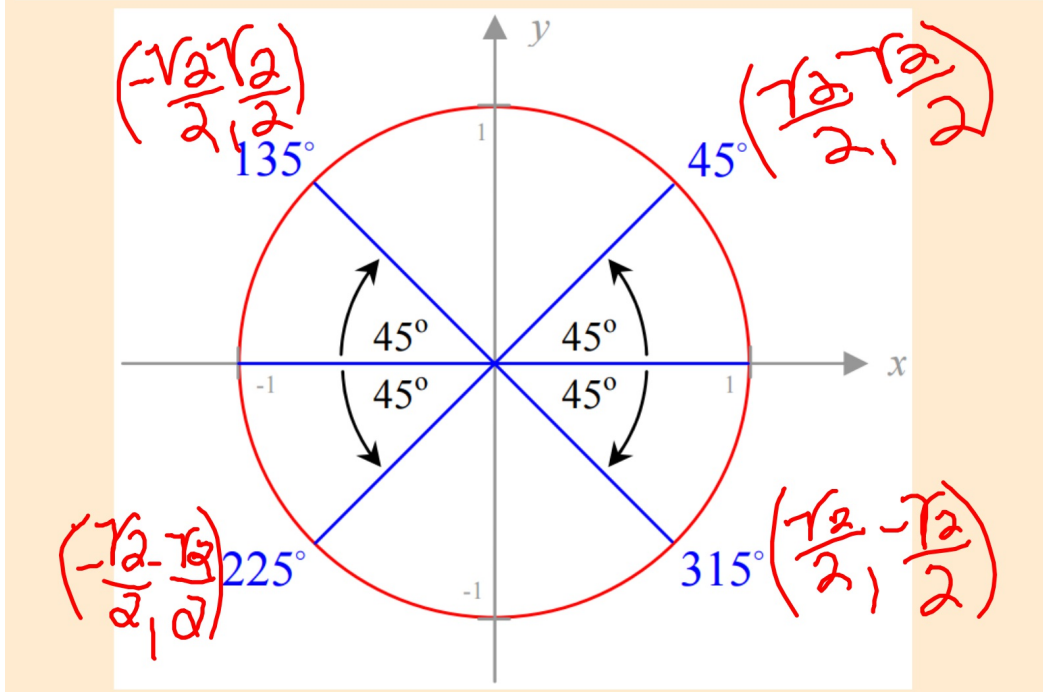
Symmetry!



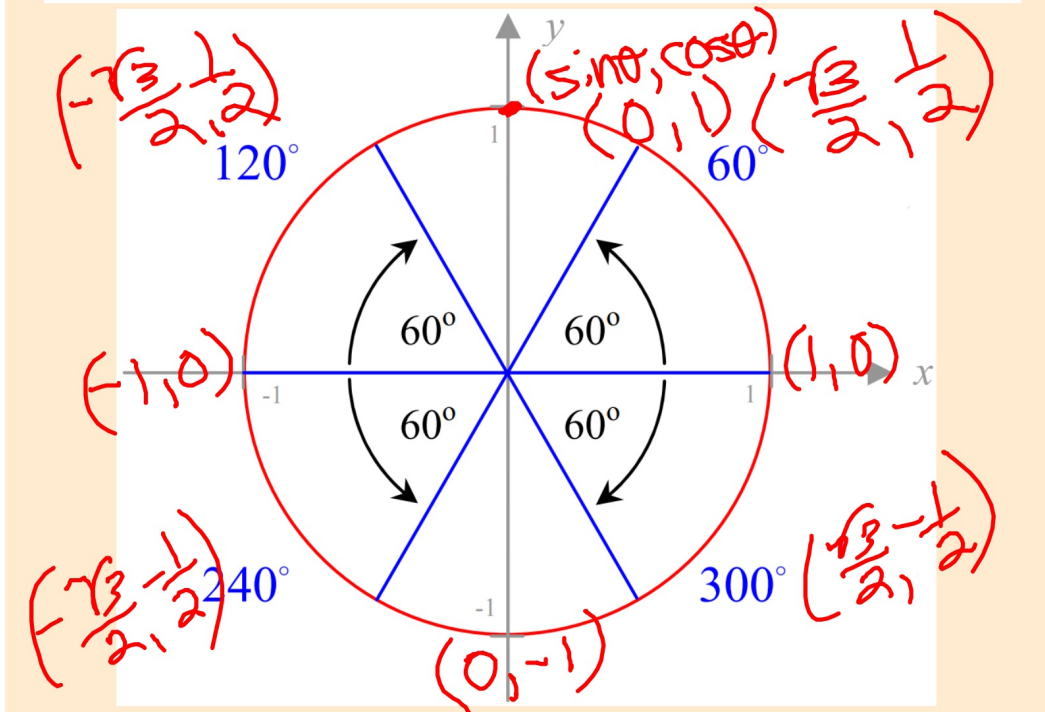
Angles with Reference angles of 30° :



Angles with Reference angles of 45° :



Angles with Reference angles of 60° :



Exercises...

Complete your Unit Circle

(Go back and complete more practice with radicals/spec. rights)

[Google: Khan Academy](#)

[Unit Circle \(~9 min\)](#)

(if you'd like a recap tonight)

<https://www.khanacademy.org/math/trigonometry/unit-circle-trig-func/unit-circle-definition-of-trig-functions/v/unit-circle-definition-of-trig-functions-1>

