

Before we begin, are there any questions from last day's work? **4.2.4**

(Wednesday's quiz will be based on this material)

(on next 2 slides)

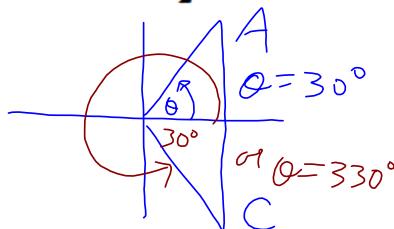
Today's Learning Goal(s):

By the end of the class, I will be able to:

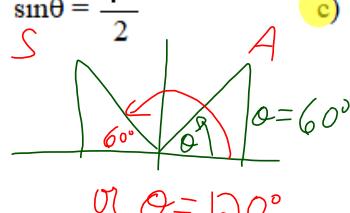
- a) sketch the sine and cosine functions.
- b) determine "any" angle
using the "CAST Rule" with the "raa" (related acute angle).

5. Use the special angles to determine two possible answers for each of the following.

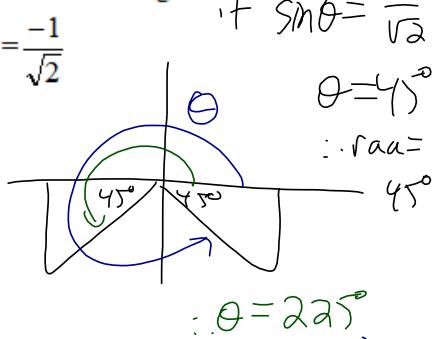
a) $\cos\theta = \frac{\sqrt{3}}{2}$



b) $\sin\theta = \frac{\sqrt{3}}{2}$



c) $\sin\theta = -\frac{1}{\sqrt{2}}$



d) $\sin\theta = \frac{1}{\sqrt{2}}$

e) $\cos\theta = \frac{1}{2}$

f) $\sin\theta = -\frac{1}{2}$

$\therefore \sin\theta = \frac{1}{\sqrt{2}}$

$\theta = 45^\circ$

$\therefore \text{raa} =$

$\therefore \theta = 225^\circ$

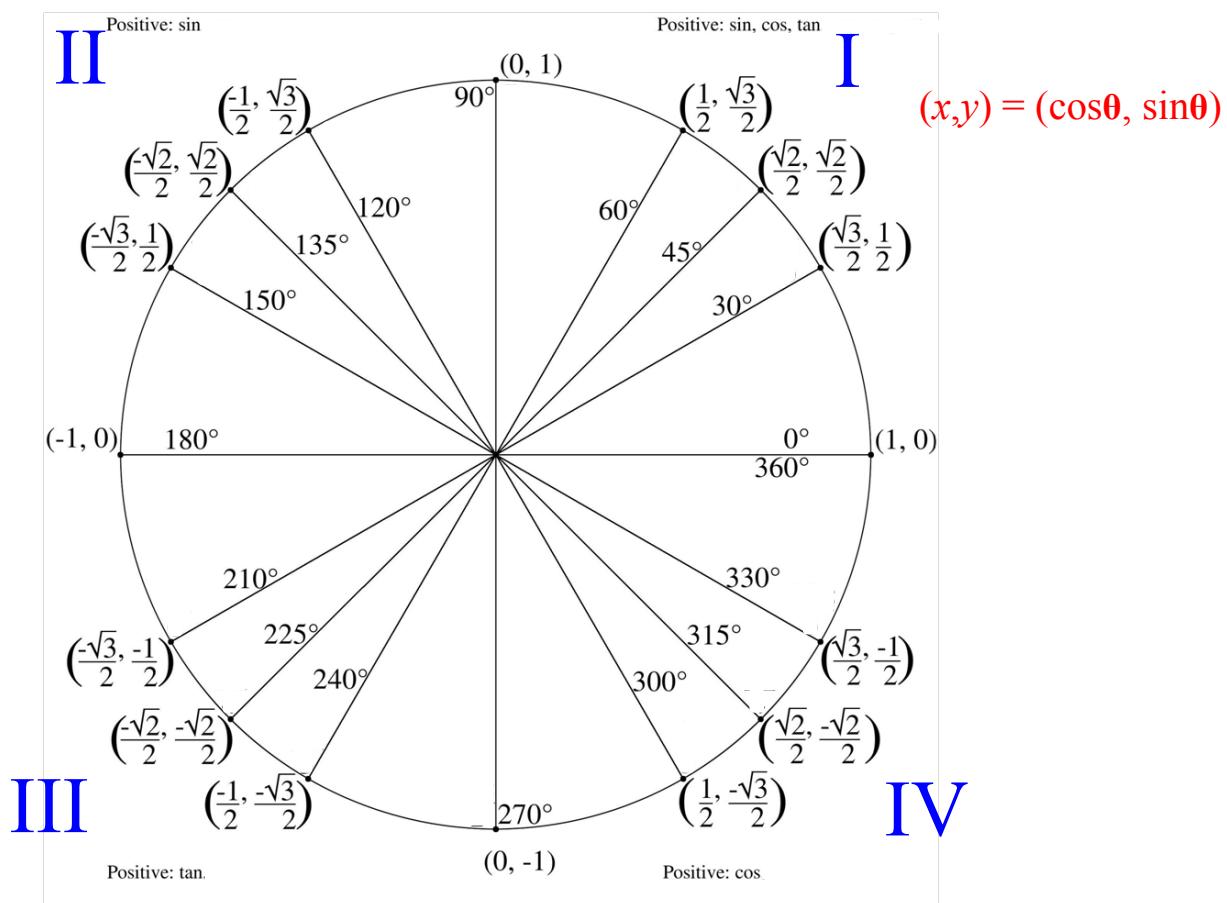
$\therefore \theta = 315^\circ$

Warm-up

Complete the chart below:
(Did you Memorize it as instructed?)

θ	30°	45°	60°
$\sin \theta$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}} \left(\frac{\sqrt{2}}{2} \right)$	$\frac{\sqrt{3}}{2}$
$\cos \theta$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}} \left(\frac{\sqrt{2}}{2} \right)$	$\frac{1}{2}$
$\tan \theta$	$\frac{1}{\sqrt{3}} \left(\frac{\sqrt{3}}{3} \right)$	1	$\sqrt{3}$

4.3.1 The Unit Circle

Date: Oct.29, 2018

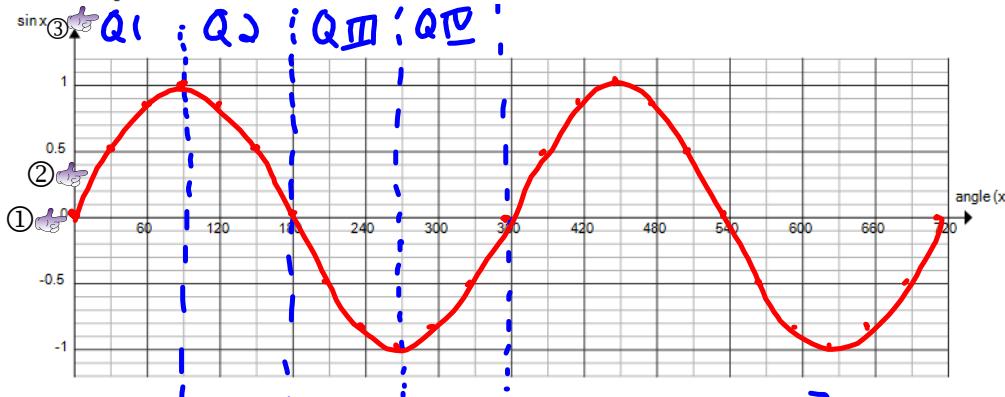
4.3.2 Investigating the Properties of Sinusoidal Functions Date: Oct.29, 2018A. Graphing $y = \sin \theta$ ($y = \sin x$)

1. Complete the table.

Angle θ ($^{\circ}$)	0	30	60	90	120	150	180	210	240	270	300	330
Exact value of y ($\sin \theta$)	0	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$
Decimal value of y (2 decimal places)	0	0.5	0.86	1	0.86	0.5	0	-0.5	-0.86	-1	-0.86	-0.5
	360	390	420	450	480	510	540	570	600	630	660	690
Exact value of y ($\sin \theta$)	0	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	1	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	0	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	-1	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$
Decimal value of y (2 decimal places)	0	0.5	0.86	1	0.86	0.5	0	-0.5	-0.86	-1	-0.86	-0.5

2. Use the decimal values of $\sin \theta$, and plot the ordered pairs $(\theta, \sin \theta)$ on the grid below.

Join the points with a smooth continuous curve.

 $\sin \theta$ $\sin x$ 3. Properties of the function $y = \sin x$

- ④ a) Length of the period: 360
 b) Domain: $\{x \in \mathbb{R}\}$
 c) Maximum value of $\sin x$: 1
 d) Minimum value of $\sin x$: -1

- b) Domain: $\{x \in \mathbb{R}\}$
 e) Range: $\{y \in \mathbb{R} | -1 \leq y \leq 1\}$

 $\{x \in \mathbb{R}\}$ $\{y \in \mathbb{R} | -1 \leq y \leq 1\}$

4.3.3 Determining the Measure of an Angle from ANY Given Trigonometric Ratio

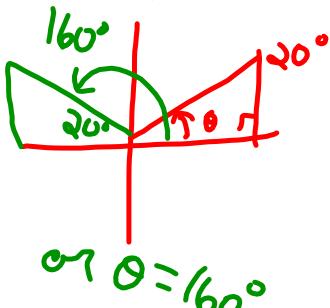
1. Use each trigonometric ratio to determine all of the values of θ , to the nearest degree, if $0^\circ \leq \theta \leq 360^\circ$.

a) $\sin\theta = 0.3423$

$\theta = \sin^{-1}(0.3423)$

$\theta \approx 20.0$

$\approx 20^\circ$ *raa*



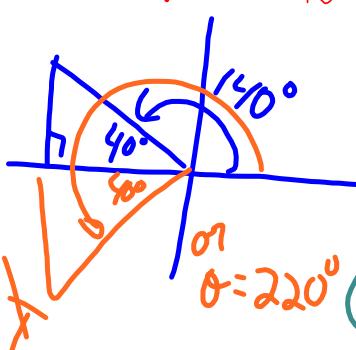
b) $\cos\theta = -0.766$

$\theta = \cos^{-1}(-0.766)$

≈ 139.9

$\approx 140^\circ$

raa $= 40^\circ$



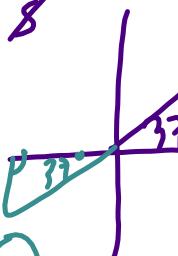
c) $\tan\theta = 0.753$

$\theta = \tan^{-1}(0.753)$

$\approx 36.9^\circ$

$\approx 37^\circ$ *raa*

$\text{or } \theta \approx 217^\circ$



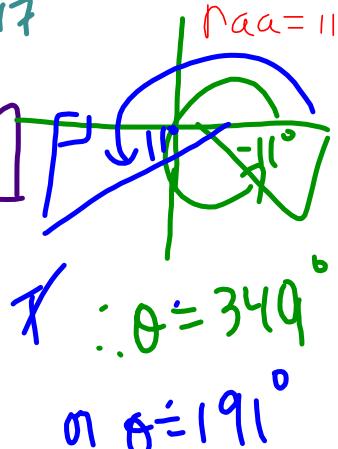
d) $\sin\theta = -0.1908$

$\theta = \sin^{-1}(-0.1908)$

≈ -10.9

$\approx -11^\circ$

raa $= 11^\circ$



Today's Homework: 4.3.3 #1, 8, 9, 12, 13