

## Today's Learning Goal(s):

Date: \_\_\_\_\_

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

- a) explain the relationship between the ratios of an angle in standard position, and the related acute angle (RAA).
- b) determine the trig ratios of angles between  $0^\circ$  and  $360^\circ$ .

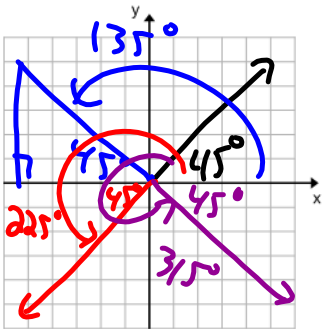
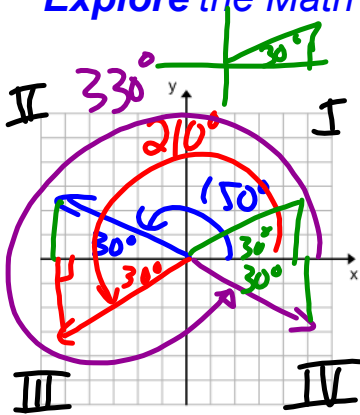
Last day's work: pp. 286-287 # 1 – 9 [13 – 15]

8.9.

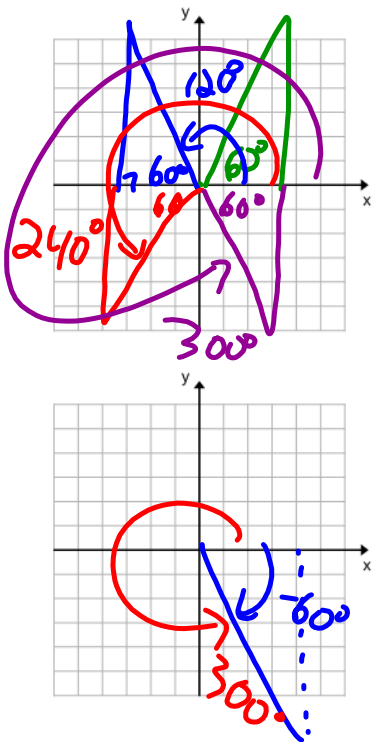
## 5.3 Exploring Trigonometric Ratios for Angles Greater Than 90°

Date: NOV. 16/15

Explore the Math page 289 A - J



Angles	Quadrant	Sine Ratio	Cosine Ratio	Tangent Ratio
Related Acute Angle $\beta = 30^\circ$	1	$\frac{1}{2}$ 0.5	$\frac{\sqrt{3}}{2}$ 0.8660	$\frac{1}{\sqrt{3}}$ 0.5773
Principal Angle $\theta = 150^\circ$	2	$\frac{1}{2}$ 0.5	-0.8660	-0.5773
$\theta = 210^\circ$	3	-0.5	-0.8660	0.5773
$\theta = 330^\circ$	4	-0.5	0.8660	-0.5773
$\beta = 45^\circ$	1	$\frac{1}{\sqrt{2}} = 0.7071$	0.7071	1
$\theta = 135^\circ$	2	0.7071	-0.7071	-1
$\theta = 225^\circ$	3	-0.7071	-0.7071	1
$\theta = 315^\circ$	4	-0.7071	0.7071	-1



Angles	Quadrant	Sine Ratio	Cosine Ratio	Tangent Ratio
$\beta = 60^\circ$	1	0.8660	0.5	1.732
$\theta = 120^\circ$	2	0.8660	-0.5	-1.732
$\theta = 240^\circ$	3	-0.8660	-0.5	1.732
$\theta = 300^\circ$	4	-0.8660	0.5	-1.732
$\beta = -60^\circ$	4	-0.8660		

### 5.4 Evaluating Trigonometric Ratios for $0^\circ \leq \theta \leq 90^\circ$

Ex. 1

a) The point P(3,4) lies on the terminal arm of an angle  $\theta$ .

Determine the primary trig ratios for  $\theta$ .

SYR CXRTYX

$$r^2 = x^2 + y^2$$

$$= 3^2 + 4^2$$

$$= 25$$

$$r = 5$$

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

$$= \frac{4}{5}$$

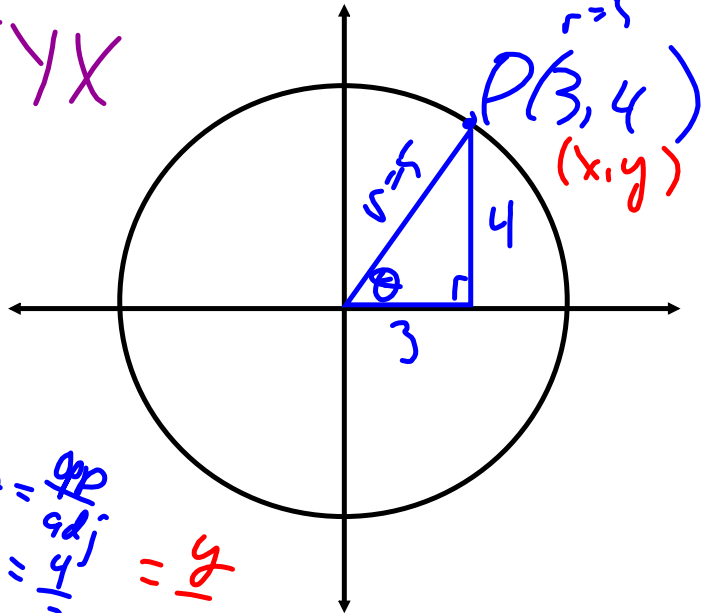
$$= \frac{y}{r}$$

$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$= \frac{3}{5}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

$$= \frac{4}{3} = \frac{y}{x}$$



b) Repeat for P(-3,4), P(-3,-4) and P(3,-4).

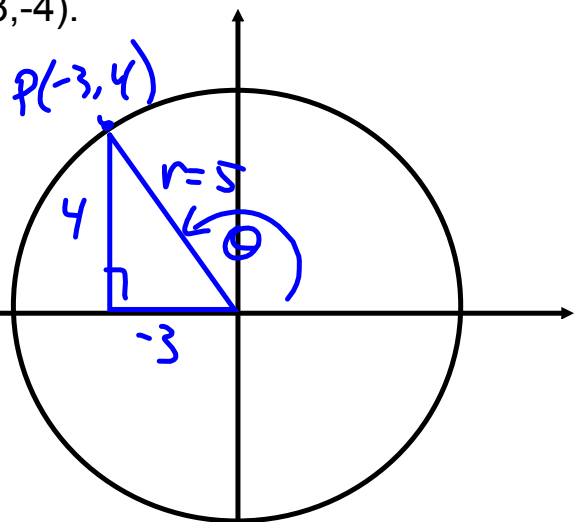
$$r^2 = x^2 + y^2$$

$$= (-3)^2 + (4)^2$$

$$= 9 + 16$$

$$= 25$$

$$r = 5 \text{ units}$$



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

$$= \frac{4}{5}$$

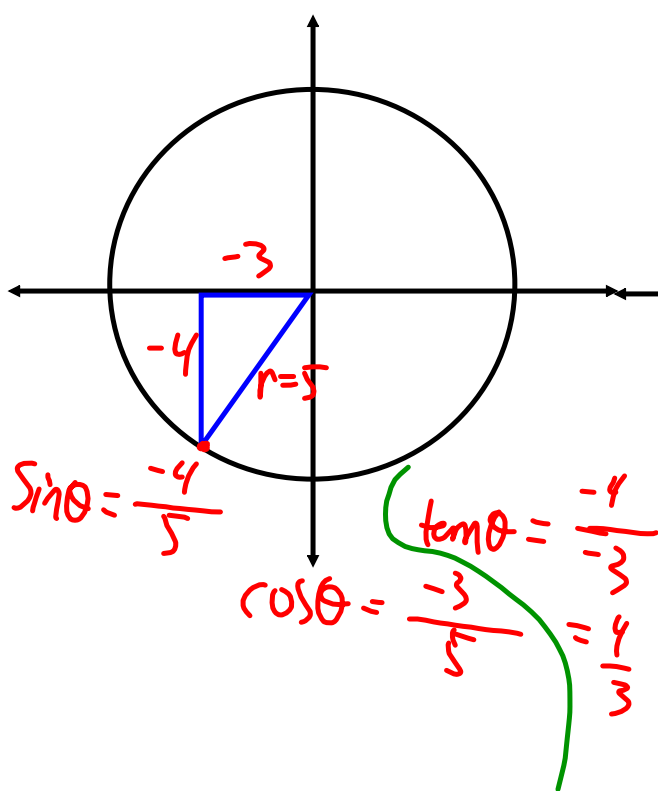
$$\cos \theta = \frac{x}{r}$$

$$= \frac{-3}{5}$$

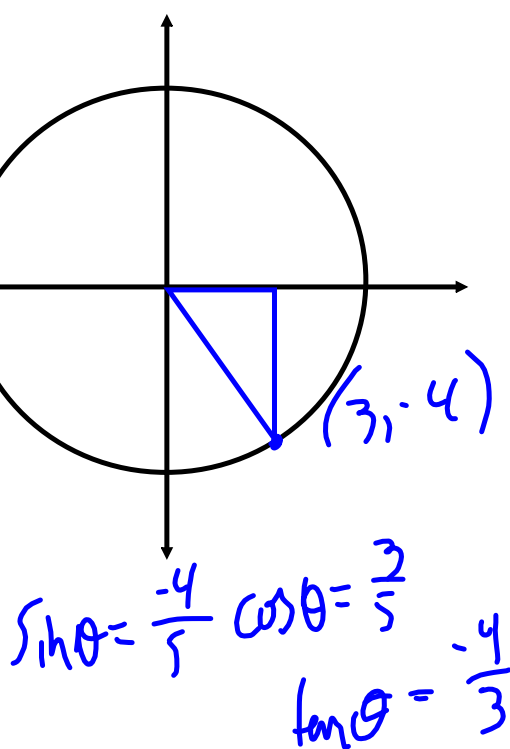
$$\tan \theta = \frac{y}{x}$$

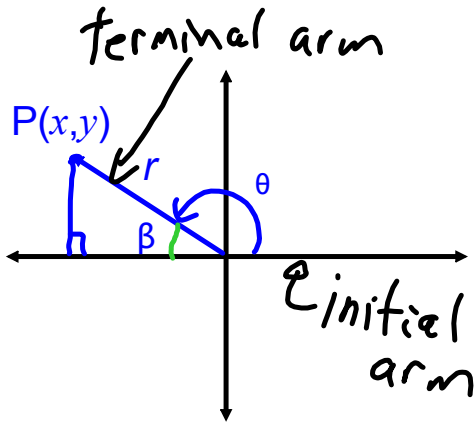
$$= \frac{4}{-3}$$

P(-3,-4)

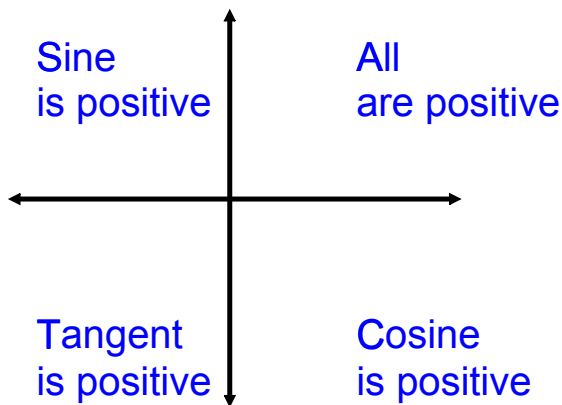


P(3,-4)





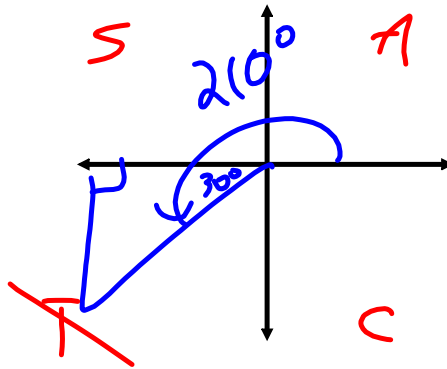
Circle Definitions for the Primary Trig Ratios



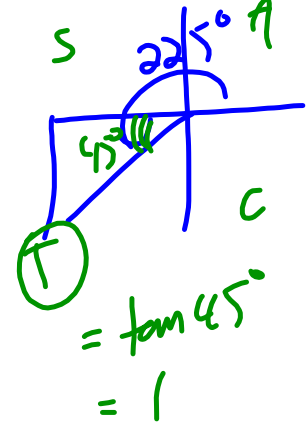
"CAST" Rule

Ex.2 Determine the exact value for  $\cos 210^\circ$ .

$$\begin{aligned} \text{a) } \cos 210^\circ &= -(\cos 30^\circ) \\ &= -\left(\frac{\sqrt{3}}{2}\right) \\ &= -\frac{\sqrt{3}}{2} \end{aligned}$$



$$\begin{aligned} \text{b) } \tan 225^\circ &= \tan 45^\circ \\ &= 1 \end{aligned}$$

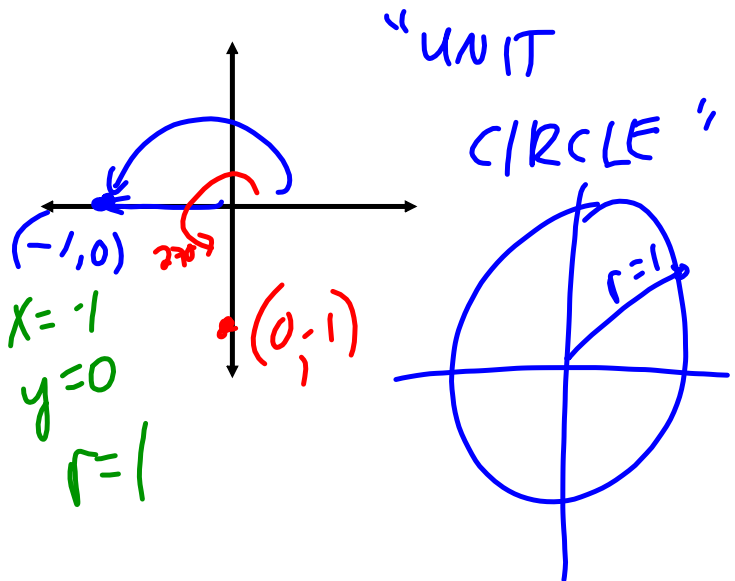


Ex.3 Determine the primary trig ratios for  $180^\circ$  and  $270^\circ$ .

$$\sin \theta = \frac{y}{r} = \frac{0}{1} = 0$$

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

$$\begin{aligned} \tan \theta &= \frac{y}{x} \\ &= \frac{0}{-1} \\ &= 0 \end{aligned}$$



**Are there any Homework Questions you would like to see on the board?**

Last day's work: pp. 286-287 # 1 – 9 [13 – 15]

Today's Homework Practice includes:

pp. 289-291 A – J (done)

p. 292 #1 – 4

pp. 299-300 #(1 – 5)ac



	$30^\circ$	$45^\circ$	$60^\circ$
$\sin \theta$	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$
$\cos \theta$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$
$\tan \theta$	$\frac{1}{\sqrt{3}}$	$1$	$\sqrt{3}$

