

Today's Learning Goal(s):

Date: _____

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

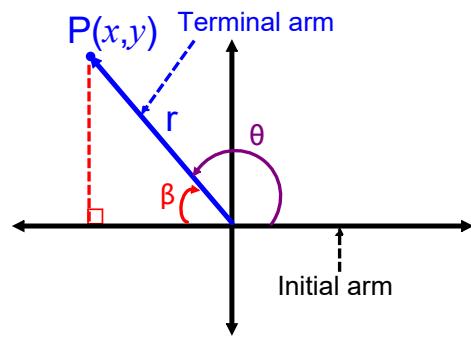
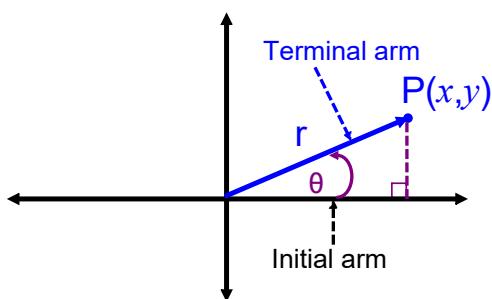
- a) explain the relationship between the ratios of an angle in standard position, and the related acute angle (RAA).
- b) determine the trig ratios of angles between 0° and 360° .

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

Defining an angle in "standard position".

θ = Principal Angle

β = Related Acute Angle (RAA)



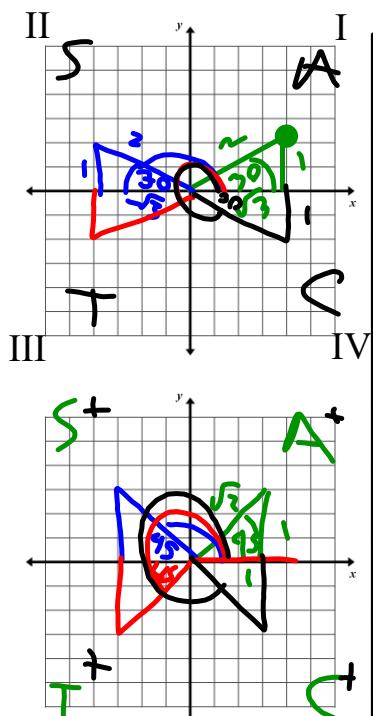
Note: In Quadrant I: $\theta = \beta$

5.3 Exploring Trigonometric Ratios for Angles Greater Than 90 °

Date: _____

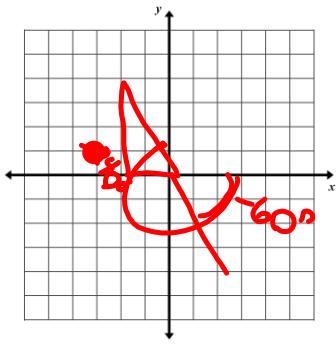
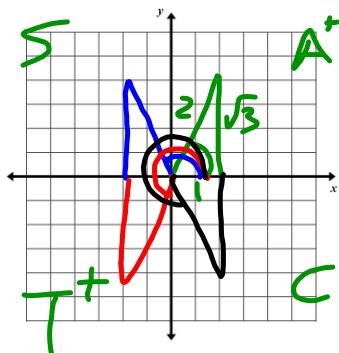
Explore the Math pp. 289-291 A - J

CAST RULE



Angles	Quadrant	Sine Ratio	Cosine Ratio	Tangent Ratio
Related Acute Angle $\beta = 30^\circ (= \theta)$	I	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$
Principal Angle $\theta = 180^\circ - 30^\circ = 150^\circ$	II	$\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{\sqrt{3}}$
$\theta = 210^\circ$	III	$-\frac{1}{2}$	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{\sqrt{3}}$
$\theta = 330^\circ$	IV	$-\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{1}{\sqrt{3}}$
$\beta = 45^\circ$	II	$\frac{1}{\sqrt{2}}$	$\frac{1}{\sqrt{2}}$	1
$\theta = 180^\circ - 45^\circ = 135^\circ$	II	$+\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	-1
$\theta = 180^\circ + 45^\circ = 225^\circ$	III	$-\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$	+1
$\theta = 360^\circ - 45^\circ = 315^\circ$	IV	$+\frac{1}{\sqrt{2}}$	$+\frac{1}{\sqrt{2}}$	$-\frac{1}{\sqrt{2}}$

A)
S
T
C



Angles	Quadrant	Sine Ratio	Cosine Ratio	Tangent Ratio
$\beta = 60^\circ$ ($= \theta$)	I	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$\sqrt{3}$
$\theta = 120^\circ$	II	$\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$-\sqrt{3}$
$\theta = 240^\circ$	III	$-\frac{\sqrt{3}}{2}$	$-\frac{1}{2}$	$\sqrt{3}$
$\theta = 300^\circ$	IV	$-\frac{\sqrt{3}}{2}$	$\frac{1}{2}$	$-\sqrt{3}$
$\beta = -60^\circ$				
$\theta =$				
$\theta =$				
$\theta =$				

5.4 Evaluating Trigonometric Ratios for $0^\circ \leq \theta \leq 360^\circ$ (Day 1)

Ex. 1

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

Determine the primary trig ratios for θ .

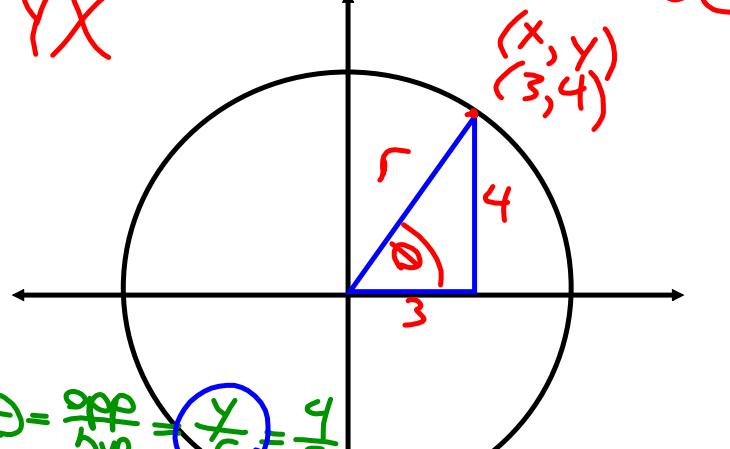
SYR CX RTYX

$$r^2 = b^2 + c^2$$

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

$$r^2 = 9 + 16$$

$$\begin{aligned} r &= \sqrt{25} \\ &= 5 \end{aligned}$$



$$\begin{aligned} \sin \theta &= \frac{\text{opp}}{\text{hyp}} = \frac{y}{r} = \frac{4}{5} \\ \cos \theta &= \frac{\text{adj}}{\text{hyp}} = \frac{x}{r} = \frac{3}{5} \\ \tan \theta &= \frac{\text{opp}}{\text{adj}} = \frac{y}{x} = \frac{4}{3} \end{aligned}$$

SYR CX RTYX

(x, y)
(3, 4)

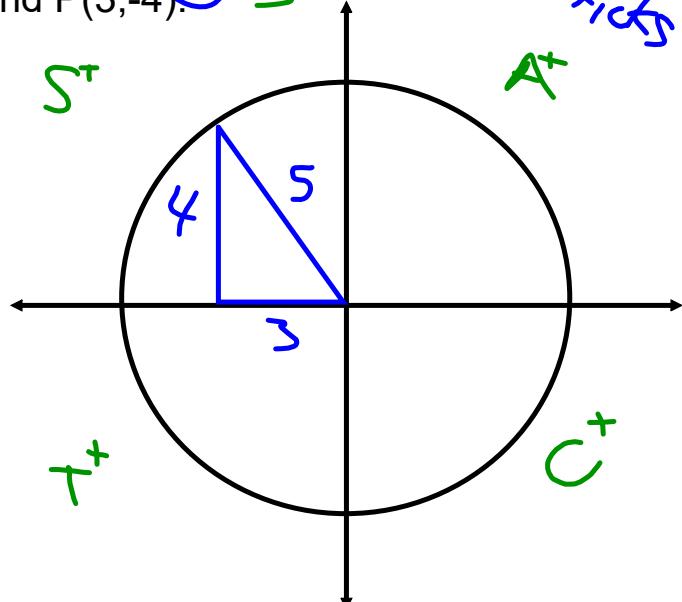
SYR CX RTYX
SK Kicker ticks

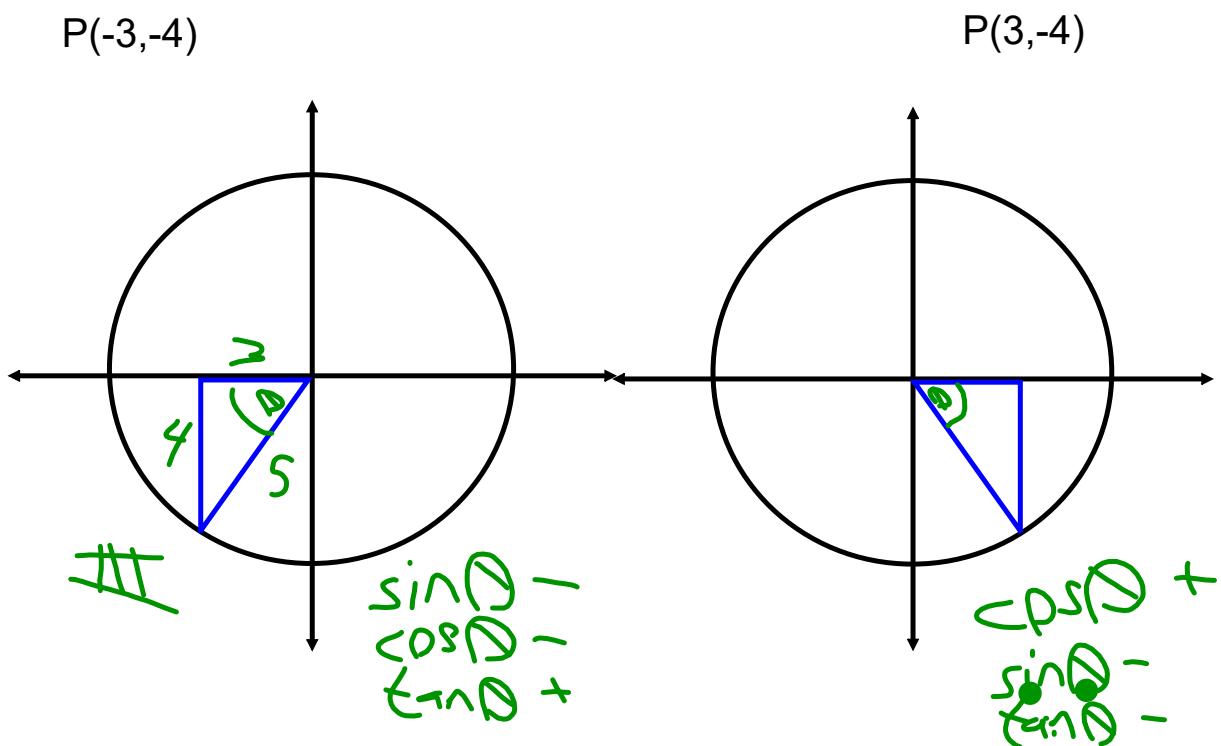
- b) Repeat for $P(-3,4)$, $P(-3,-4)$ and $P(3,-4)$.

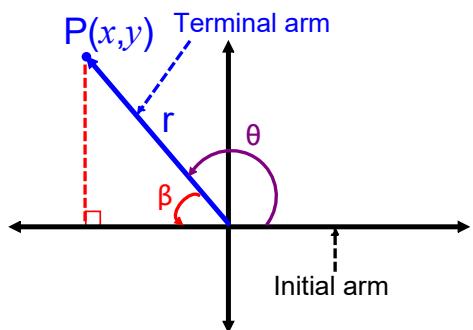
$$\sin \theta = \frac{y}{r} = \frac{4}{5}$$

$$\cos \theta = \frac{x}{r} = \frac{-3}{5}$$

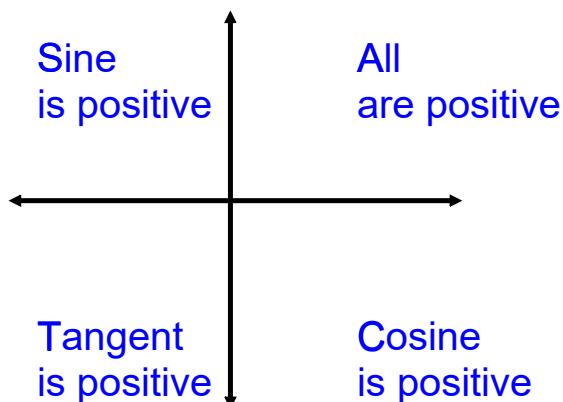
$$\tan \theta = \frac{y}{x} = \frac{4}{-3}$$





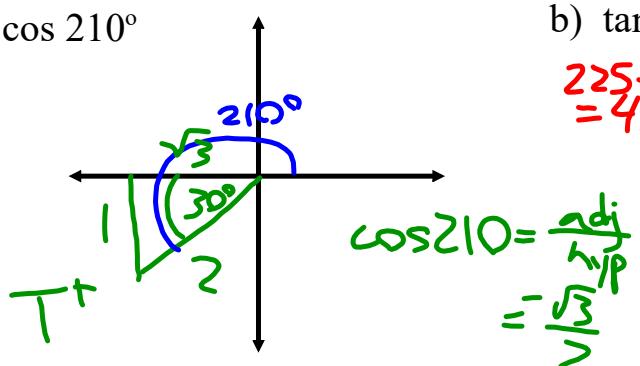


Circle Definitions for the Primary Trig Ratios



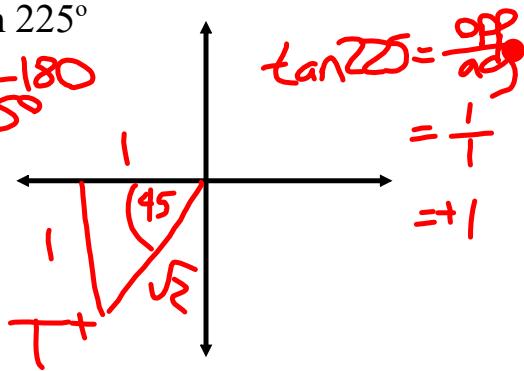
Ex.2 Determine the exact value for $\cos 210^\circ$.

a) $\cos 210^\circ$



b) $\tan 225^\circ$

$$\begin{aligned} 225^\circ - 180^\circ \\ = 45^\circ \end{aligned}$$



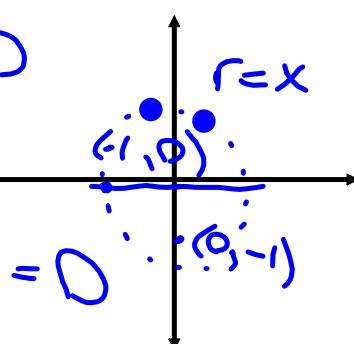
Ex.3 Determine the primary trig ratios for 180° and 270° .

S Y R C X R T Y X

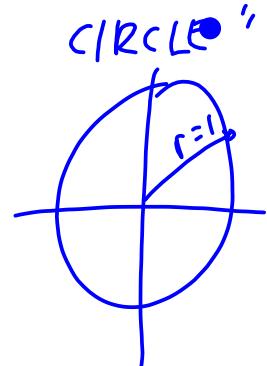
$$\sin 180^\circ = \frac{y}{r} = \frac{0}{-1} = 0$$

$$\cos 180^\circ = \frac{x}{r} = \frac{-1}{-1} = 1$$

$$\tan 180^\circ = \frac{y}{x} = \frac{0}{-1} = 0$$



"UNIT"



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 via today's lesson)
p. 292 #1 – 4
pp. 299-300 #(1 – 5)ac