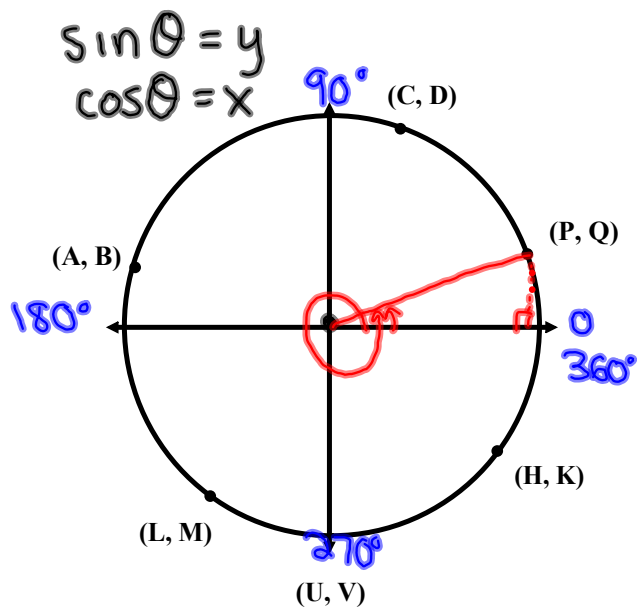


# Questions from Homework!!!



$$\sin 330^\circ = K$$

$$\cos 270 = U$$

$$\sin 170 = B$$

$$\cos 240 = L$$

$$\sin 80 = D$$

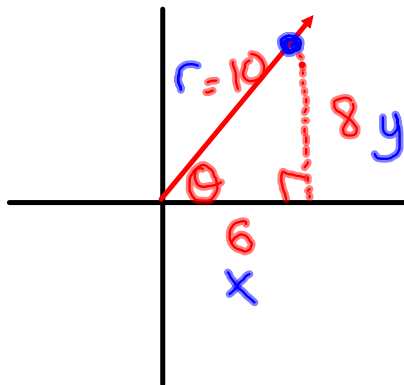
$$\cos 330 = H$$

$$\sin 30 = Q$$

$$\cos 390 = P$$

# Warm Up

The ordered pair (6, 8) lies on the terminal arm of an angle. Determine the 6 trig ratios of this angle



$$\begin{aligned}\sin \theta &= \frac{y}{r} & \csc \theta &= \frac{r}{y} \\ \cos \theta &= \frac{x}{r} & \sec \theta &= \frac{r}{x} \\ \tan \theta &= \frac{y}{x} & \cot \theta &= \frac{x}{y}\end{aligned}$$

$$\begin{aligned}x^2 + y^2 &= r^2 \\ 36 + 64 &= r^2 \\ 100 &= r^2 \\ \underline{\underline{10}} &= r\end{aligned}$$

$$\sin \theta = \frac{8}{10} = \frac{4}{5}$$

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

$$\cos \theta = \frac{6}{10} = \frac{3}{5}$$

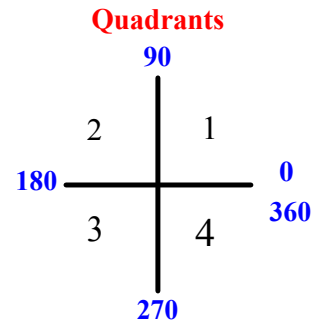
$$\sec \theta = \frac{5}{3}$$

$$\tan \theta = \frac{8}{6} = \frac{4}{3}$$

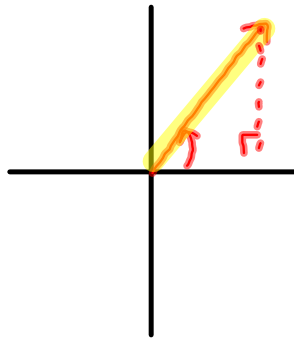
$$\cot \theta = \frac{3}{4}$$

## Sketching Angles

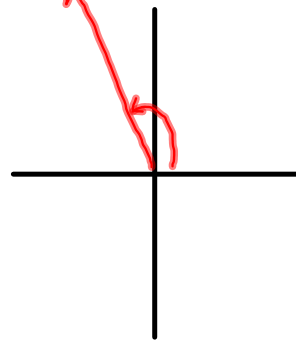
If the angle is positive rotate counterclockwise. If the angle is negative rotate clockwise. What do you notice about "a" and "d"?



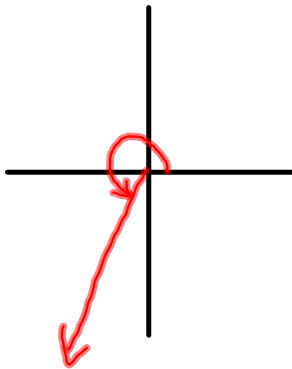
a)  $50^\circ$



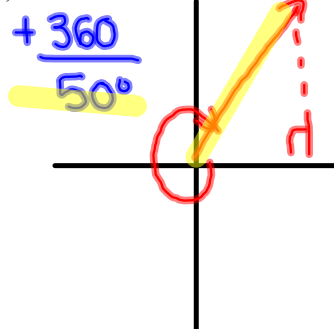
b)  $120^\circ$



c)  $240^\circ$



d)  $-310^\circ$



## Coterminal Angles

Angles that share the same terminal side/terminal arm are said to be **coterminal**

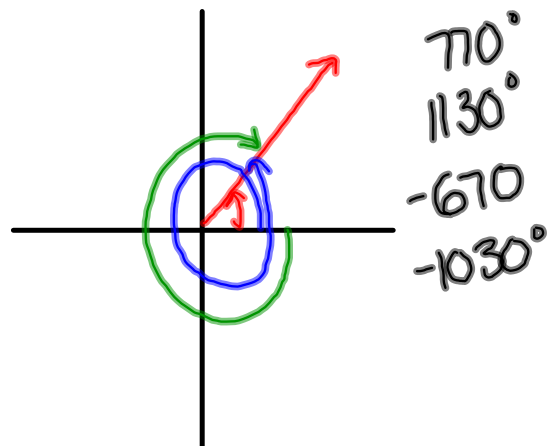
To find other coterminal angles we can use the following formula:

$$A_c = A + k * 360 \quad \text{where } k \text{ is a constant ex. } 2, 3, -2, \text{ etc.}$$

Find an angle coterminal to 50

$$\begin{aligned} A_c &= 50 + 360(1) \\ &= 410^\circ \end{aligned}$$

$$\begin{aligned} A_c &= 50 + 360(-1) \\ &= 50 - 360 \\ &= -310^\circ \end{aligned}$$



# Principal Angles $\rightarrow$ smallest positive coterminal angle between 0 and $360^\circ$

Ex:  $13784^\circ$  *Think about unwinding angle this*

1) Divide By 360 (how many rotations??)

$$13784 \div 360 = 38.\overline{28}$$

2) Get rid of # of full rotations

$$38.\overline{28} - 38 = 0.\overline{28}$$

3) Multiply decimal by 360 to find principal angle

$$0.\overline{28} \times 360 = \boxed{104^\circ}$$

## Try These!

**139275**<sup>°</sup>

$$139275^\circ \div 360 = 386.875$$

$$386.875 - 386 = 0.875$$

$$0.875 \times 360 = \boxed{315^\circ}$$

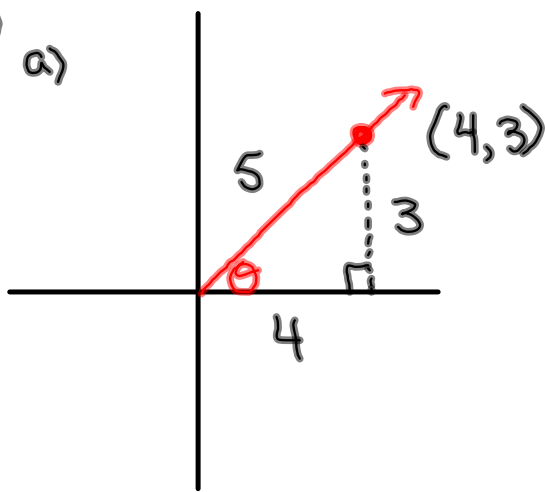
**-27342**<sup>°</sup>

$$-27342 \div (-360) = 75.95$$

$$75.95 - 75 = 0.95$$

$$0.95 \times 360 = \boxed{342^\circ}$$

③ a)



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

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

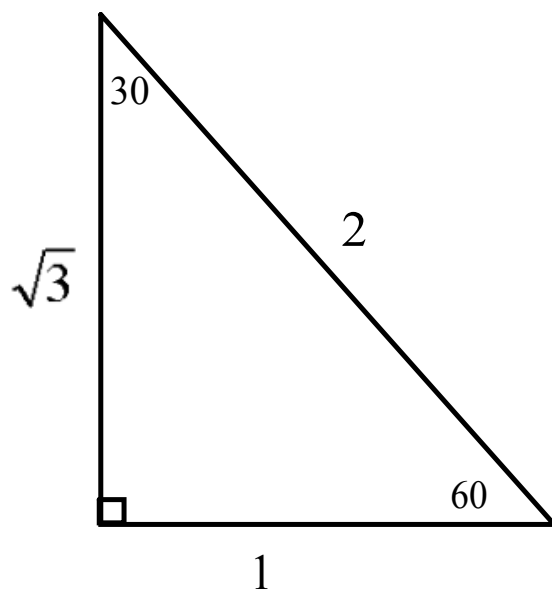
$$\tan \theta = \frac{3}{4}$$

④ Find  $\csc \theta$ ,  $\sec \theta$ ,  $\cot \theta$

# Special Angles

I.  $30^\circ$  and  $60^\circ$

**MEMORIZE THESE DIAGRAMS!!!**

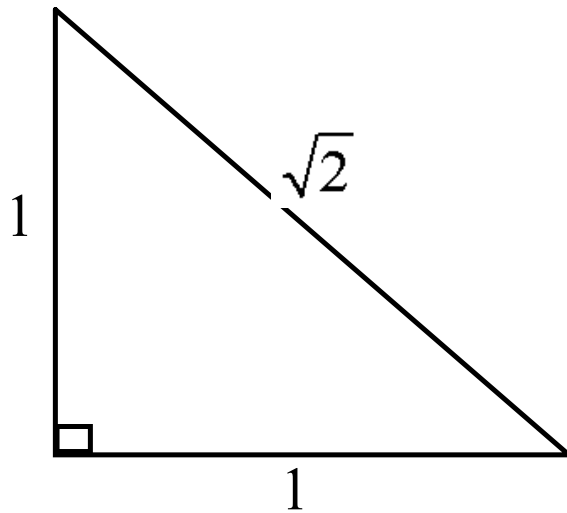


	$30^\circ$	$60^\circ$
<b>Sin</b>		
<b>Cos</b>		
<b>Tan</b>		

# Special Angles

II.  $45^\circ$

**MEMORIZE THESE DIAGRAMS!!!**



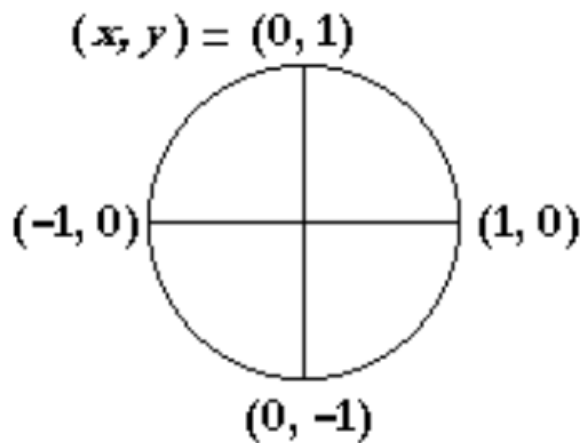
	45
Sin	
Cos	
Tan	



## MEMORIZE THESE DIAGRAMS!!!

### III. Quadrantal Angles (Multiples of $90^\circ$ )

#### Unit Circle



	$0^\circ$	$90^\circ$	$180^\circ$	$270^\circ$	$360^\circ$
<b>sin</b>	0	1	0	-1	0
<b>cos</b>	1	0	-1	0	1
<b>tan</b>	0	undefined	0	undefined	0