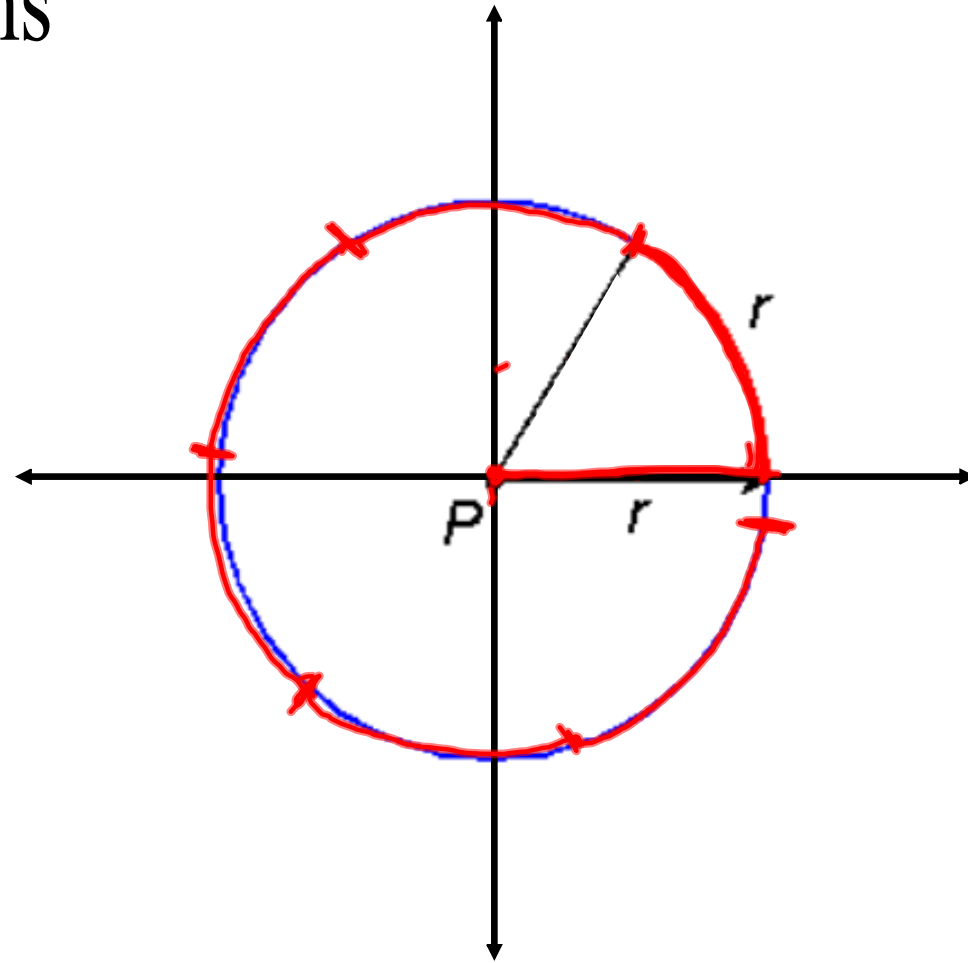
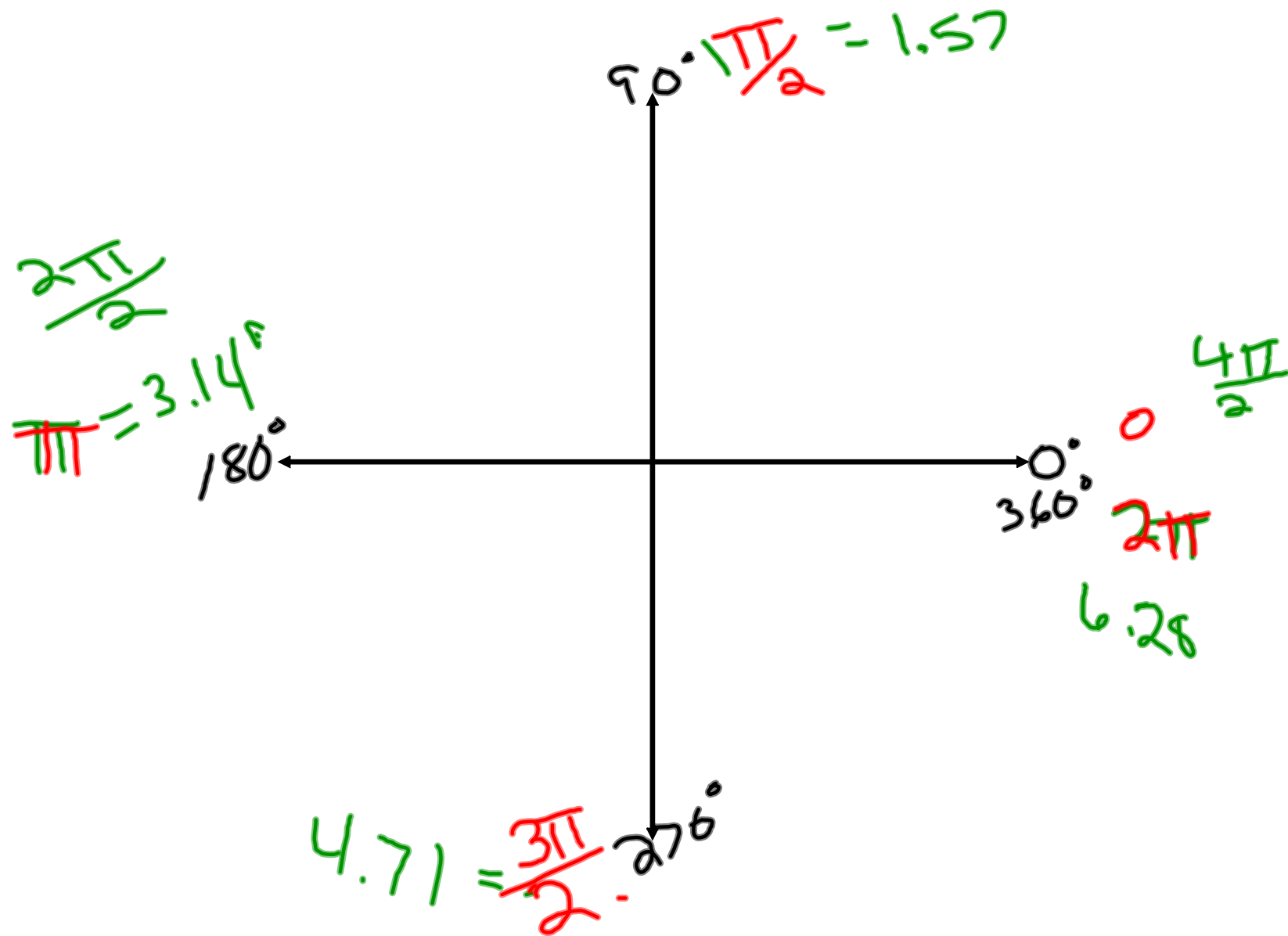


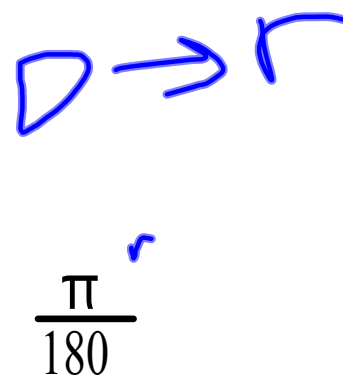
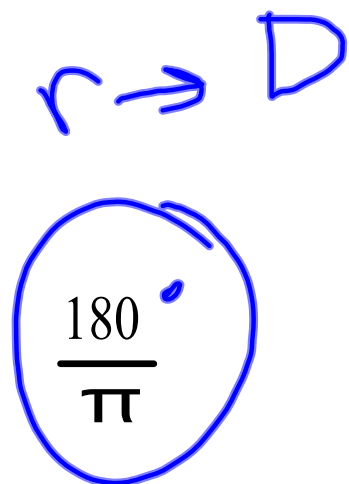
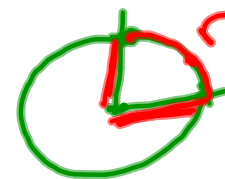
# 8.3 Radians





## Radians -

The measure of an angle with its vertex at the center of a circle and with an intercepted arc on the circle equal in length to the radius of the circle



radians has no unit because it is the ratio of one length to another measuring angles in terms of real numbers.

Convert radians to degrees and degrees to radians

$$\frac{3\pi}{10} \times \frac{180}{\pi} = 54^\circ$$

$$\frac{5\pi}{6} \times \frac{180}{\pi} = 150^\circ$$

$$30^\circ \times \frac{\pi}{180} = \frac{\pi}{6}$$

$$45^\circ \times \frac{\pi}{180} = \frac{\pi}{4}$$

$$225^\circ \times \frac{\pi}{180} = \frac{5\pi}{4}$$

.750

100

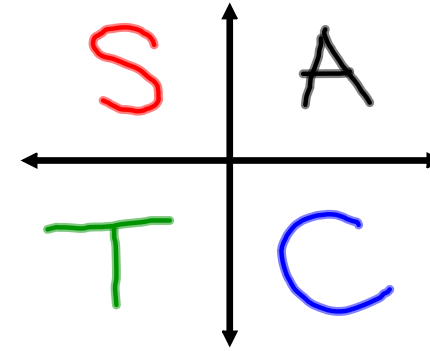
$$\frac{5\pi}{6} \quad 150^\circ$$

$$.750 \quad 42.97^\circ$$

$$100 = 5729.5^\circ$$

remember this for degrees

$$\begin{array}{llll}
 \theta = \alpha & \text{or} & \alpha = \theta & \text{(First quadrant )} \\
 \theta = 180^\circ - \alpha & \text{or} & \alpha = 180^\circ - \theta & \text{(Second quadrant )} \\
 \theta = 180^\circ + \alpha & \text{or} & \alpha = \theta - 180^\circ & \text{(Third quadrant )} \\
 \theta = 360^\circ - \alpha & \text{or} & \alpha = 360^\circ - \theta & \text{(Fourth quadrant )}
 \end{array}$$

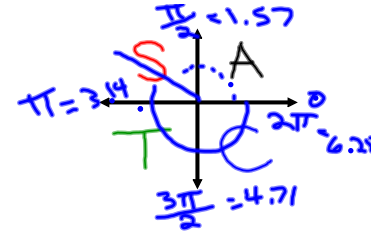


use this for radians

$$\left\{ \begin{array}{llll}
 \theta = \alpha & \text{or} & \alpha = \theta & \text{(First quadrant )} \\
 \theta = \pi - \alpha & \text{or} & \alpha = \pi - \theta & \text{(Second quadrant )} \\
 \theta = \pi + \alpha & \text{or} & \alpha = \theta - \pi & \text{(Third quadrant )} \\
 \theta = 2\pi - \alpha & \text{or} & \alpha = 2\pi - \theta & \text{(Fourth quadrant )}
 \end{array} \right.$$

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$\theta = \alpha$	or	$\alpha = \theta$	(First quadrant )
$\theta = \pi - \alpha$	or	$\alpha = \pi - \theta$	(Second quadrant )
$\theta = \pi + \alpha$	or	$\alpha = \theta - \pi$	(Third quadrant )
$\theta = 2\pi - \alpha$	or	$\alpha = 2\pi - \theta$	(Fourth quadrant )

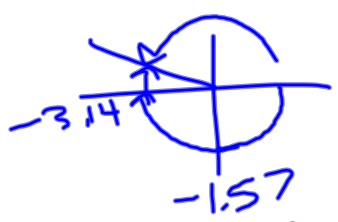


Evaluate the given trigonometric functions without changing to degree measure.

$$\cos(0.9305) = .5974$$

$$\sin(4.52) = -.9815$$

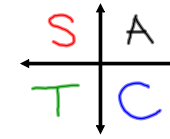
$$\sin(-3.4) = .2555$$



$$\csc(6.19) = -\frac{1}{\sin(6.19)} = 10.74$$

$$\cos\left(\frac{\pi}{6}\right) = .866$$

$\theta = \alpha$	or	$\alpha = \theta$	(First quadrant )
$\theta = \pi - \alpha$	or	$\alpha = \pi - \theta$	(Second quadrant )
$\theta = \pi + \alpha$	or	$\alpha = \theta - \pi$	(Third quadrant )
$\theta = 2\pi - \alpha$	or	$\alpha = 2\pi - \theta$	(Fourth quadrant )



Find  $\theta$  to four significant digits for 0

$$0 \leq \theta < 2\pi$$

$$\cos \theta = 0.9135$$

$$\cos^{-1}(0.9135)$$

$$\alpha = .4190$$

I  
.4190

IV  
 $2\pi - .4190$   
5.864

$$\cot \theta = 1.860$$

$$\tan^{-1}\left(\frac{1}{1.860}\right)$$

$$\alpha = .4933$$

I  
.4933

III  
 $\pi + .4933$   
3.635

$$\frac{1}{\tan(\ )}$$

$$\csc \theta = 3.940$$

$$\sin^{-1}\left(\frac{1}{3.940}\right)$$

$$\alpha = .2566$$

I  
.2566

II  
 $\pi - .2566$   
2.885