Index Card #16 (Back & Front)

Unit Circle

θ	θ Radians	Sin θ	Cos θ	Tan θ
30°	$\dfrac{\pi}{6}$	$\dfrac{1}{2}$	$\dfrac{\sqrt{3}}{2}$	$\dfrac{\sqrt{3}}{3}$
45°	$\dfrac{\pi}{4}$	$\dfrac{\sqrt{2}}{2}$	$\dfrac{\sqrt{2}}{2}$	**1**
60°	$\dfrac{\pi}{3}$	$\dfrac{\sqrt{3}}{2}$	$\dfrac{1}{2}$	$\sqrt{3}$
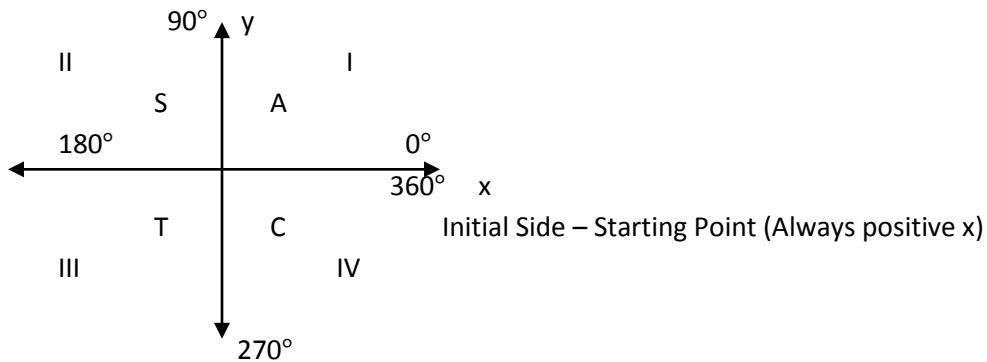
From the Unit Circle Below:

$\sin 0° = 0$ $\cos 0° = 1$ $\tan 0° = \dfrac{0}{1} = 0$

$\sin 90° = 1$ $\cos 90° = 0$ $\tan 90° = \dfrac{1}{0} = undefined$

$\sin 180° = 0$ $\cos 180° = -1$ $\tan 180° = \dfrac{0}{-1} = 0$

$\sin 270° = -1$ $\cos 270° = 0$ $\tan 270° = \dfrac{-1}{0} = undefined$

$\sin 360° = 0$ $\cos 360° = 1$ $\tan 360° = \dfrac{0}{1} = 0$

Unit Circle

II

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

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

$\tan \theta = \frac{y}{x}$ 180°

90°

(0,1)   (x,y)

θ
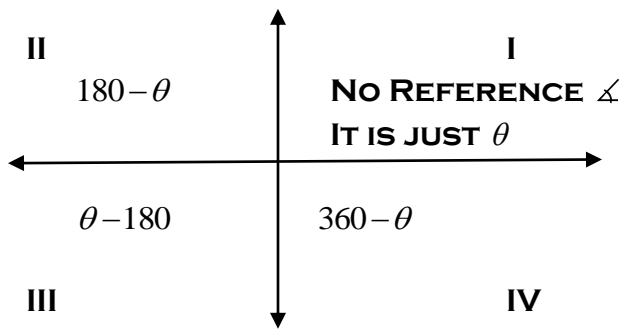
(-1,0)   (1,0)   0°
360°

(0,-1)

270°

I

III

IV
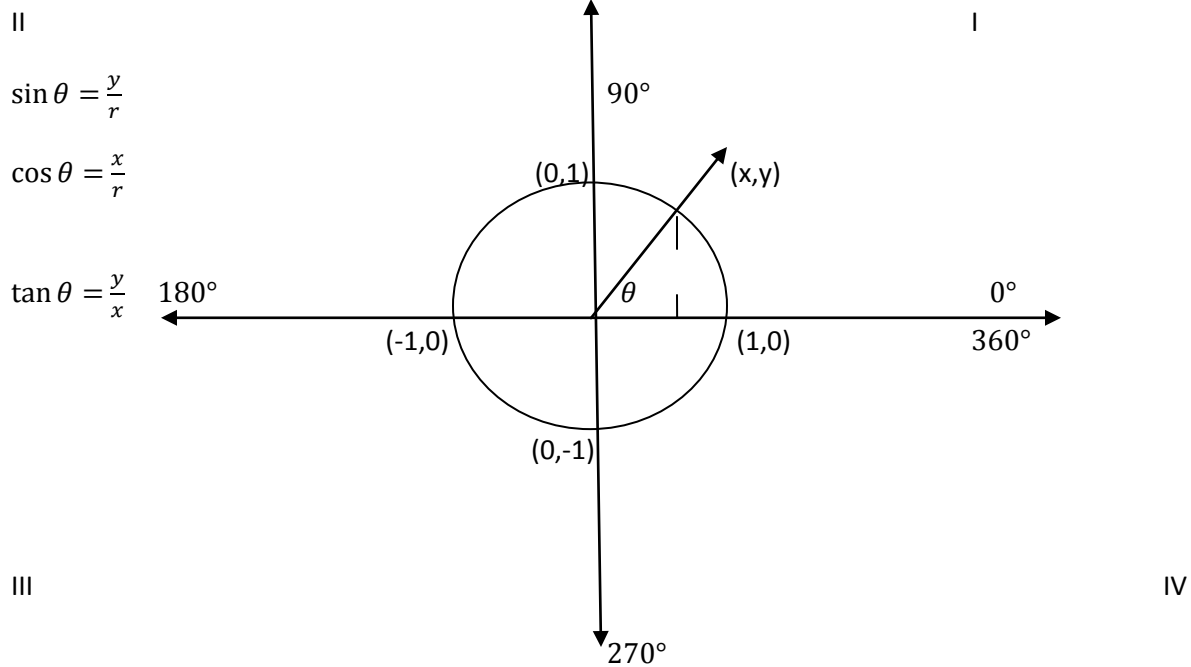
Reference Angles

- **A Reference Angle is Always POSITIVE**
- **A Reference Angle always goes from the Terminal Side of the angle to the X-AXIS**

STEPS:
1. **Draw the angle in standard position**
2. **Find the reference angle:**
   The reference angle ALWAYS goes to the X-AXIS!!!!!!

II

$180 - \theta$

I

No Reference ∡
It is just θ

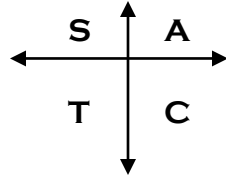$\theta - 180$ $360 - \theta$

III   IV

STOP

OR......Keep Going If Rewrite As a Function of a Positive Acute Angle

3. **Rewrite as a <u>Function of a Positive Acute Angle</u>**
    Ex. cos 45º

4. **Assign Positive or Negative depending on Quadrant**

$$
\begin{array}{c|c}
\text{S} & \text{A} \\
\hline
\text{T} & \text{C}
\end{array}
$$

                                           STOP

Or.....Keep Going If Find the Exact Value..

5. **<u>Find the Exact Value</u>**
    Use your chart to determine what the value of the function is

Remember Make the Triangle in the Quadrant if Given:
- **Sin** θ **(Or other Trig Function) = Fraction**
- **Make Triangle In the Quadrant based on** $\frac{y}{r}$ **or what the Trig Function is**
- **Use Pythagorean Theorem** $a^2 + b^2 = c^2$ **to find the missing side**
- **Positive or Negative Based on the Quadrant**