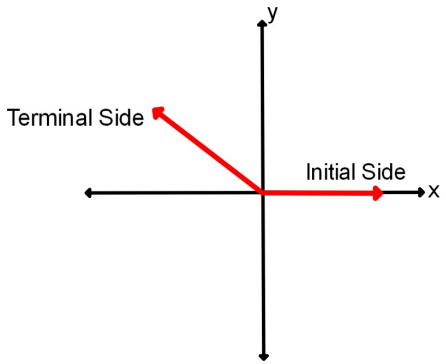
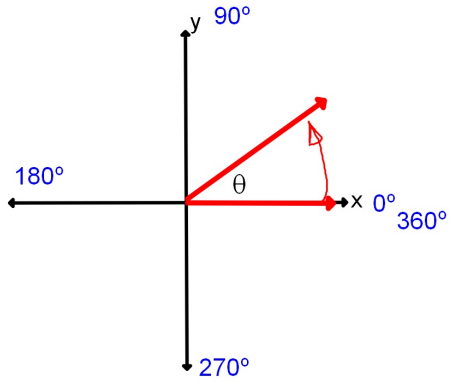
Sec 13-2 Angles in Standard Position:

- Vertex is at the origin
- One ray is on the positive x-axis.



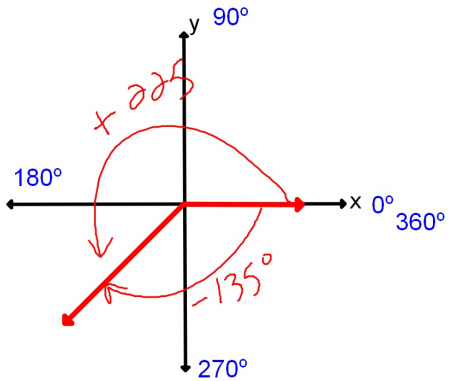
Measuring an angle in standard position:

- 0° is on the positive x-axis
- Positive angles are measured Counter-Clockwise



The terminal side is in the middle of the third quadrant.
Give two possible measures for this angle.

θ= −135° θ= 225°



Can you give 2 more possible measures of this angle?

θ= −495°

θ= 585°

Coterminal Angles: Angles in standard position that have the same terminal side.

They start and stop in the same spot but aren't the same angle. How could this be?

Find a positive and a negative coterminal angle for each given angle.

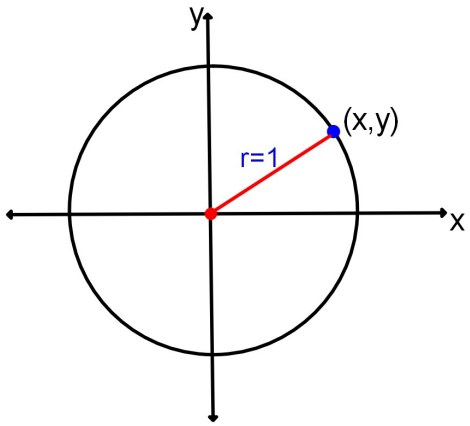
To find coterminal angles take the original angle and ± multiples of 360°

1. θ=800° Pos 1160° or 440° Neg −280°

2. θ= -70° Pos 290 Neg −430

The Unit Circle:

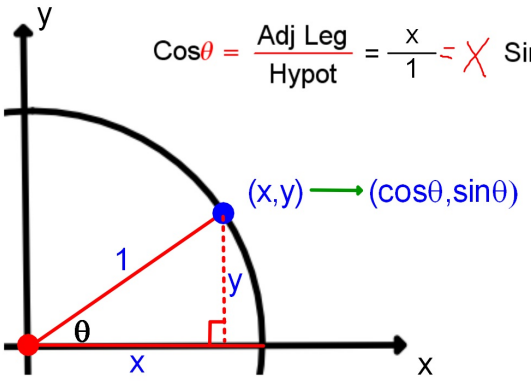
A circle whose center is at the origin and its radius = 1.



Find the exact value of each:

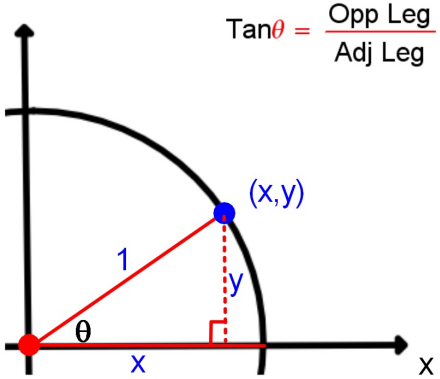
cosθ & sinθ

$\text{Cos}\theta = \frac{\text{Adj Leg}}{\text{Hypot}} = \frac{x}{1} = x$ $\text{Sin}\theta = \frac{\text{Opp Leg}}{\text{Hypot}} = \frac{y}{1} = y$



Tanθ

$\text{Tan}\theta = \frac{\text{Opp Leg}}{\text{Adj Leg}} = \frac{y}{x}$

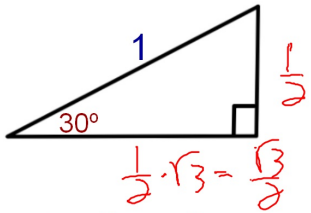


Using the Unit Circle:

Cosine of any angle = x-coordinate of the point on the Unit Circle corresponding to that angle.

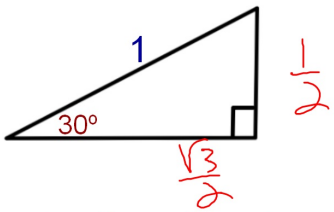
Sine of any angle = y-coordinate of the point on the Unit Circle corresponding to that angle.

Tangent of any angle = the ratio of $\frac{\text{y-coordinate}}{\text{x-coordinate}}$ of the point on the Unit Circle corresponding to that angle.



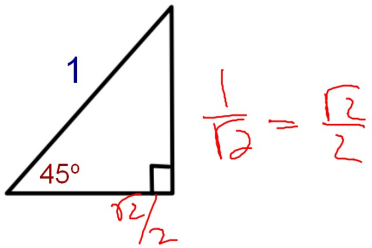
Find the exact value of each:

1. Sin30° = $\frac{\frac{1}{2}}{1} = \frac{1}{2}$
2. Cos30° $\frac{\frac{\sqrt{3}}{2}}{1} = \frac{\sqrt{3}}{2}$
3. Sin60° = $\frac{\sqrt{3}}{2}$
4. Cos60° = $\frac{1}{2}$



Find the exact value of each:

1. Tan30° $\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$ $\frac{1}{2} \cdot \frac{2}{\sqrt{3}}$ $= \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$
2. Tan60° = $\frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} = \sqrt{3}$



Find the exact value of each:

1. Sin45° $\frac{\sqrt{2}}{2}$
2. Cos45° $\frac{\sqrt{2}}{2}$
3. Tan 45° $\frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$