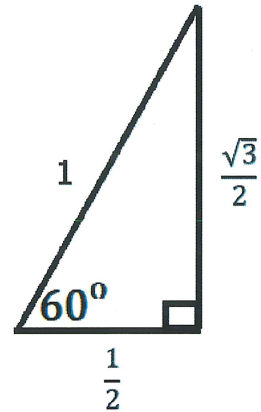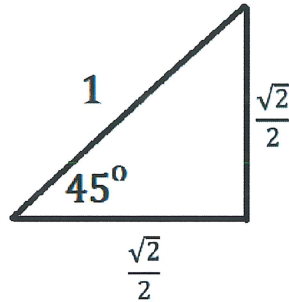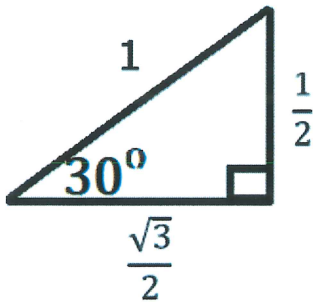**Trig Functions of General Angles Notes (Degrees)**
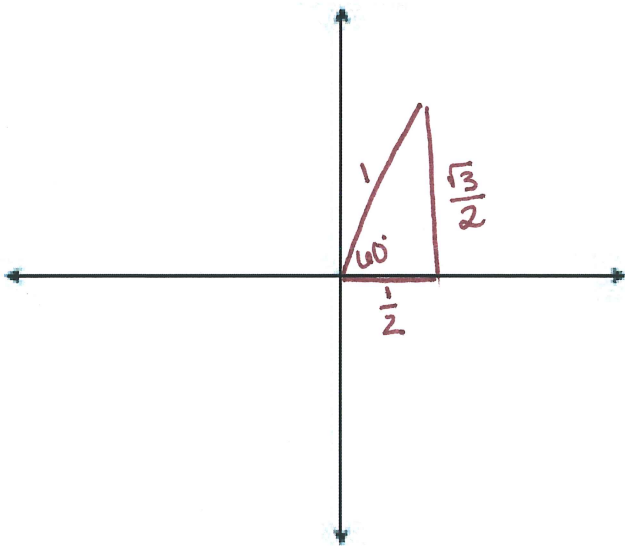
To find the EXACT trigonometric values Notes
1.) Sketch the angle
2.) Label the reference angle
3.) Draw a triangle to the x-axis and label sides
4.) Find the trig values

Recall that the radius is one because we are working with the unit circle.
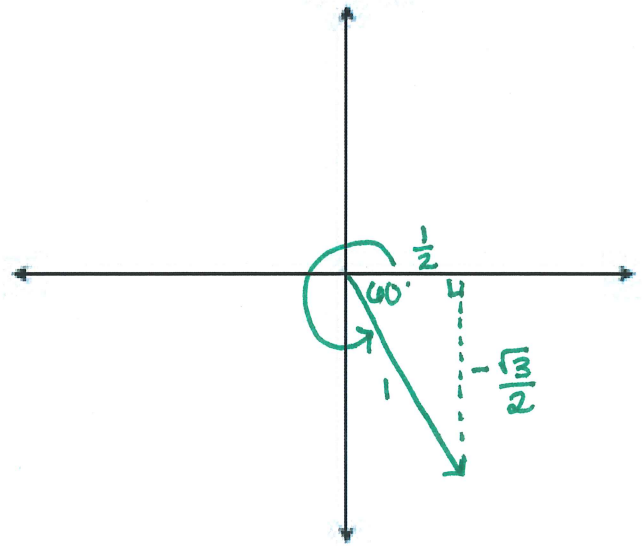
Triangle 1: $30°$, hypotenuse 1, opposite side $\frac{1}{2}$, adjacent side $\frac{\sqrt{3}}{2}$

Triangle 2: $45°$, hypotenuse 1, opposite side $\frac{\sqrt{2}}{2}$, adjacent side $\frac{\sqrt{2}}{2}$

Triangle 3: $60°$, hypotenuse 1, opposite side $\frac{\sqrt{3}}{2}$, adjacent side $\frac{1}{2}$

1. Find the exact value of sin 60°.

2. Find the exact value of cos 300°.

$$\text{Sin } 60° = \frac{\frac{\sqrt{3}}{2}}{1}$$

$$\boxed{\text{Sin } 60° = \frac{\sqrt{3}}{2}}$$

$$\text{COS } 300° = \frac{\frac{1}{2}}{1}$$
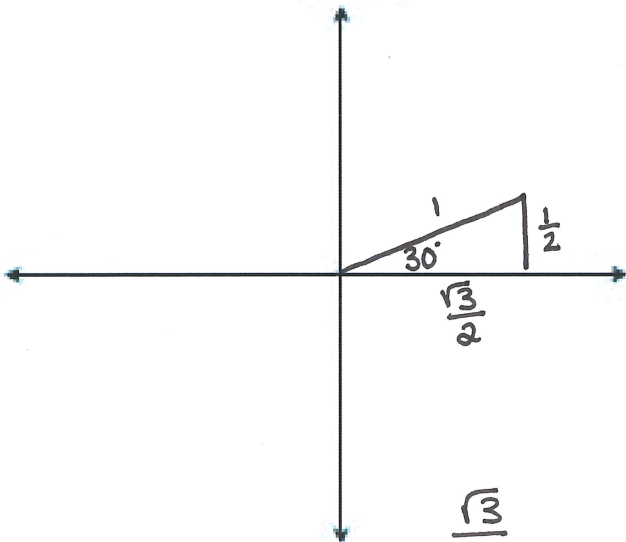
$$\boxed{\text{COS } 300° = \frac{1}{2}}$$

3. Find the exact value of sin 120°.

$$\text{Sin } 120° = \dfrac{\frac{\sqrt{3}}{2}}{1}$$
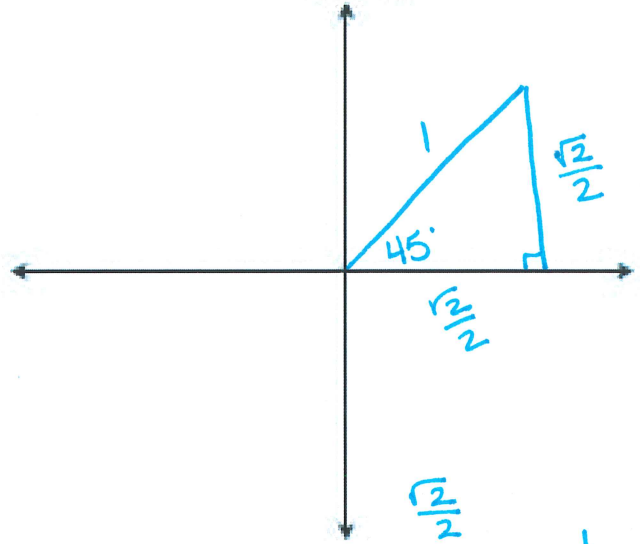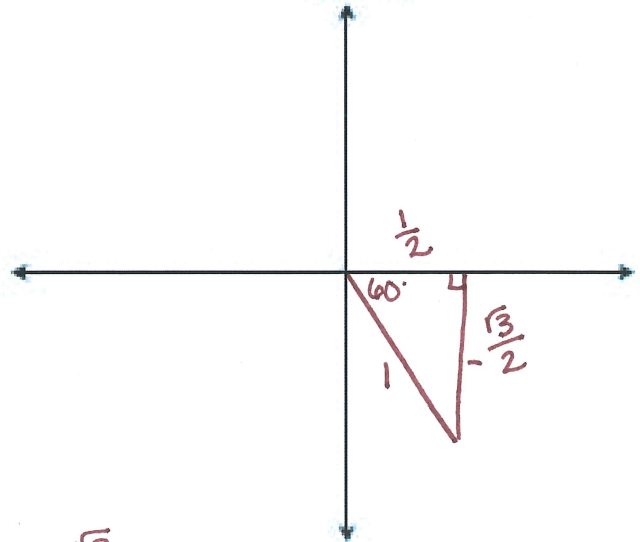
$$\boxed{\text{Sin } (120°) = \dfrac{\sqrt{3}}{2}}$$

4. Find the exact value of tan 45°.

$$\tan 45° = \dfrac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}} = 1$$

$$\boxed{\tan 45° = 1}$$
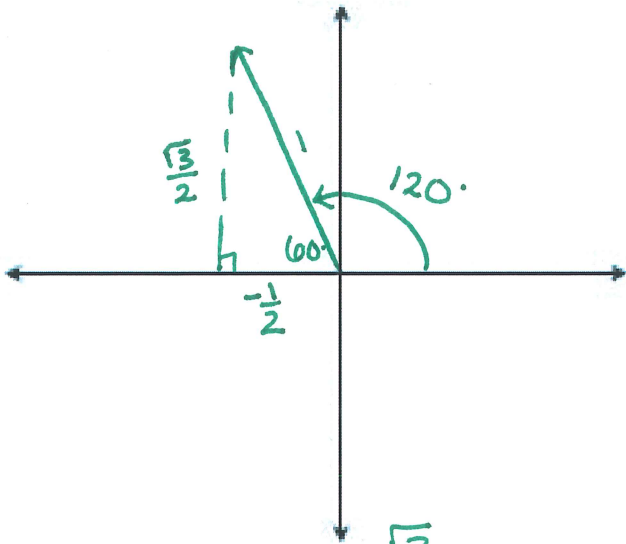
5. Find the exact value of cos 30°.

$$\text{Cos } 30° = \dfrac{\frac{\sqrt{3}}{2}}{1}$$

$$\boxed{\text{Cos } 30° = \dfrac{\sqrt{3}}{2}}$$

6. Find the exact value of tan 300°.
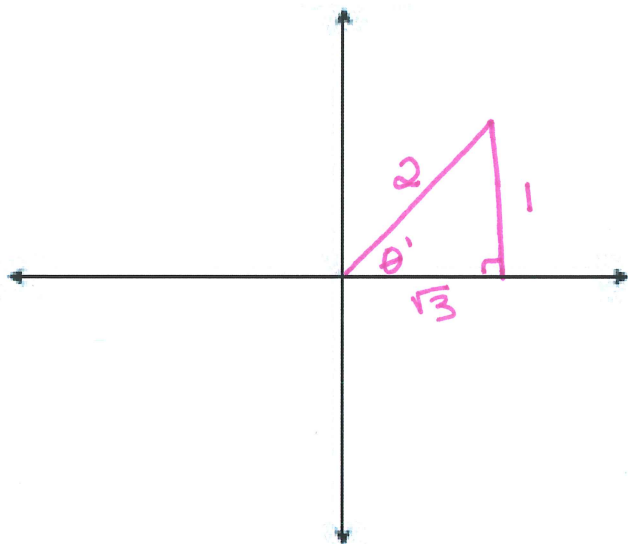

$$\tan 300° = \dfrac{-\frac{\sqrt{3}}{2}}{\frac{1}{2}} = -\dfrac{\sqrt{3}}{2} \cdot \dfrac{2}{1}$$

$$\boxed{\tan 300° = -\sqrt{3}}$$

7. If $\sin\theta = \dfrac{1}{2}$ and in quadrant I, complete the following:

    a.) Construct the triangle on the coordinate plane.
    b.) Find the value of the reference angle in degrees.
    c.) Find the length of the missing side.
    d.) Find the value of $\cos\theta$.

a.)

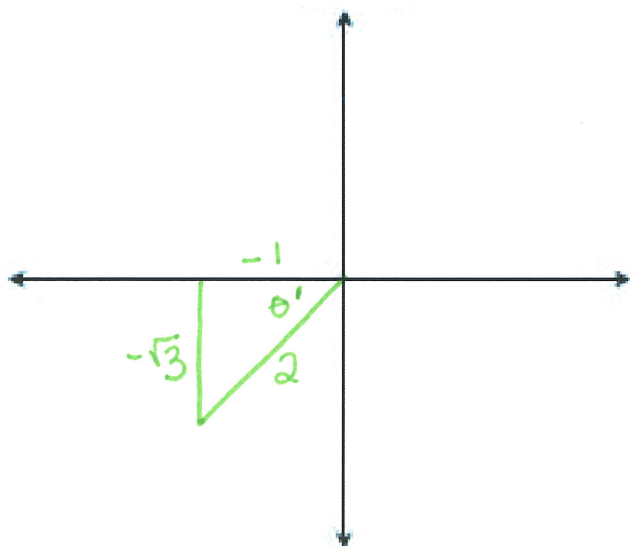b.) Reference angle $\theta' = 30°$

c.) missing side length = $1^2 + x^2 = 2^2$
$$x^2 = 3$$
$$\boxed{x = \sqrt{3}}$$

d.) $\cos\theta = \dfrac{\sqrt{3}}{2}$

If $\cos\theta = -\dfrac{1}{2}$ and in quadrant III, complete the following:

    a.) Construct the triangle on the coordinate plane.
    b.) Find the value of the reference angle in degrees.
    c.) Find the length of the missing side.
    d.) Find the value of $\tan\theta$.

a.)

b.) Reference angle $\theta' =$

c.) missing side length = $(-1)^2 + y^2 = 2^2$
$$y = -\sqrt{3}$$

d.) $\tan\theta = \dfrac{-\sqrt{3}}{-1}$

$$\boxed{\tan\theta = \sqrt{3}}$$