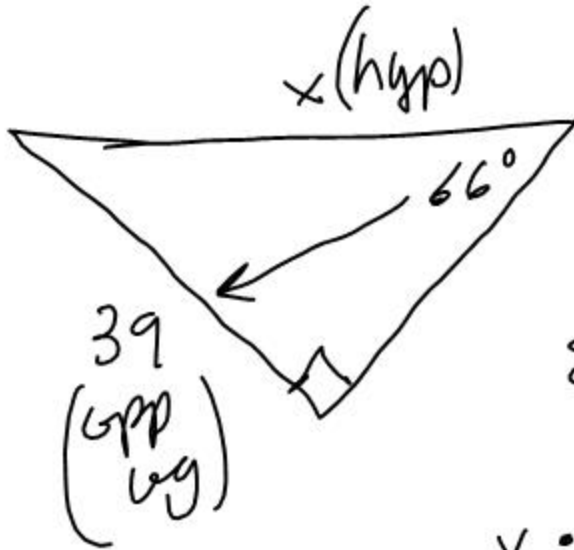


#12



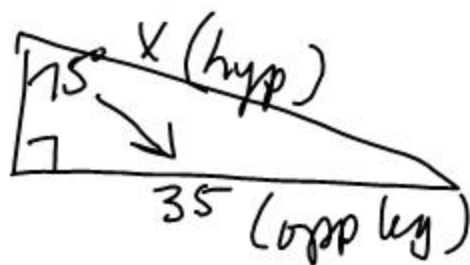
$$\sin 66^\circ = \frac{39 \leftarrow \text{opp}}{x \leftarrow \text{hyp}}$$

$$x \cdot \sin 66^\circ = 39$$

$$x = \frac{39}{\sin 66^\circ}$$

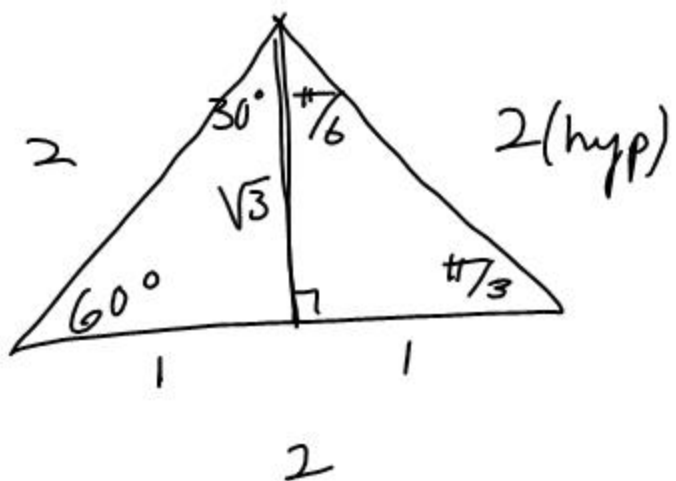
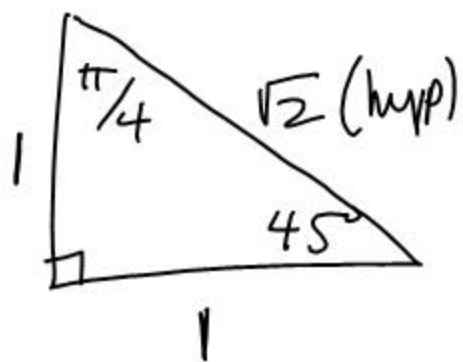
$$x \approx 42.7$$

#18.



$$\sin 75^\circ = \frac{35 \leftarrow \text{opp}}{x \leftarrow \text{hyp}}$$

$$x = \frac{35}{\sin 75^\circ} \approx 36.2$$

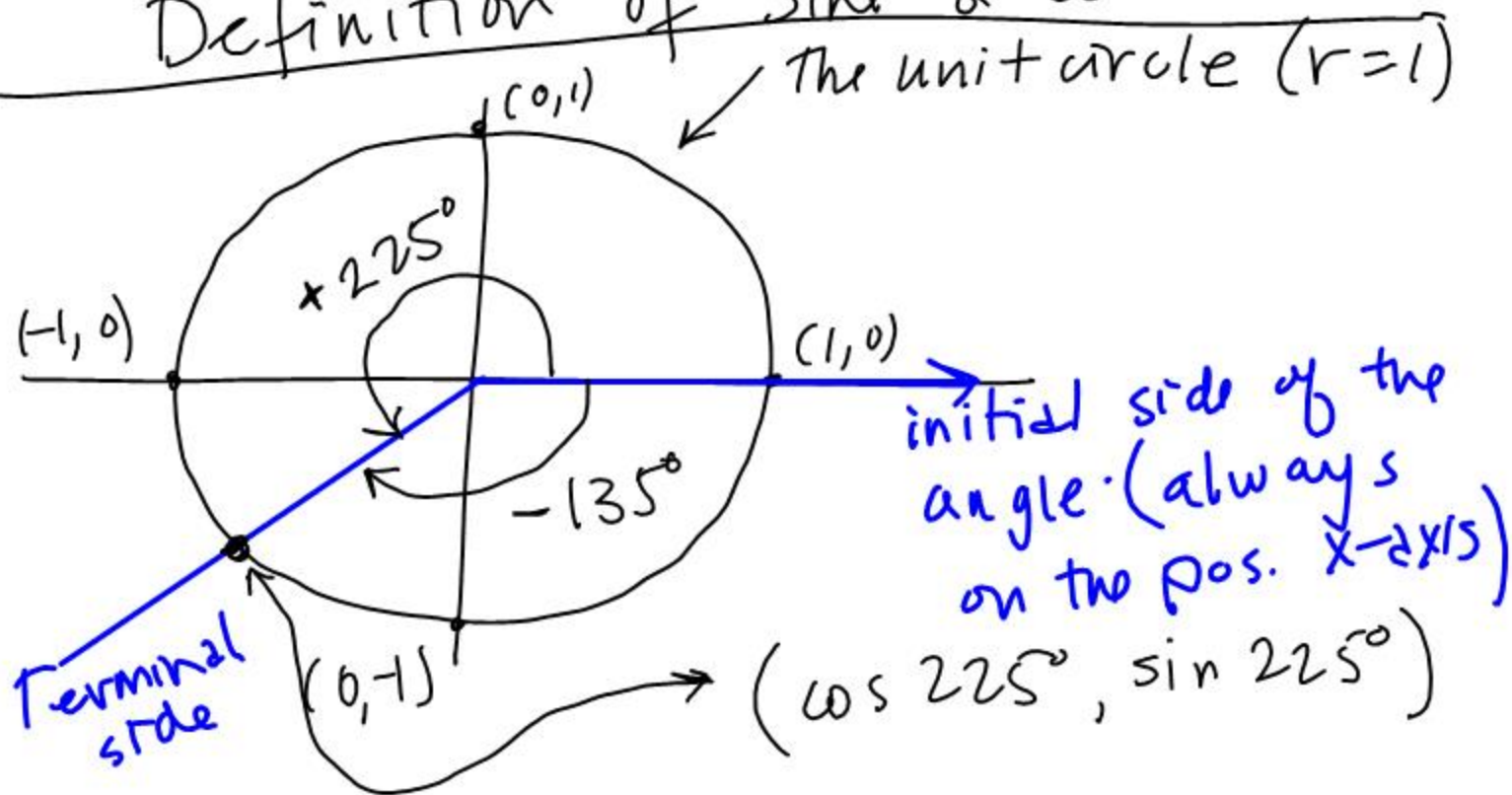


# 7.  $\tan 45^\circ = 1$

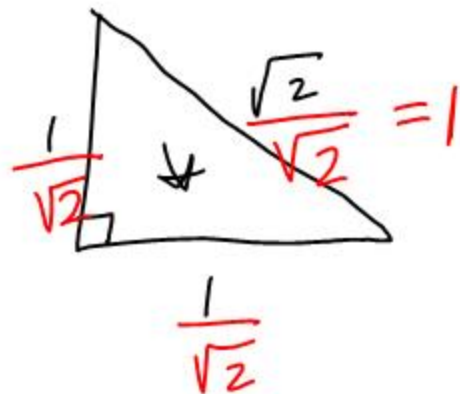
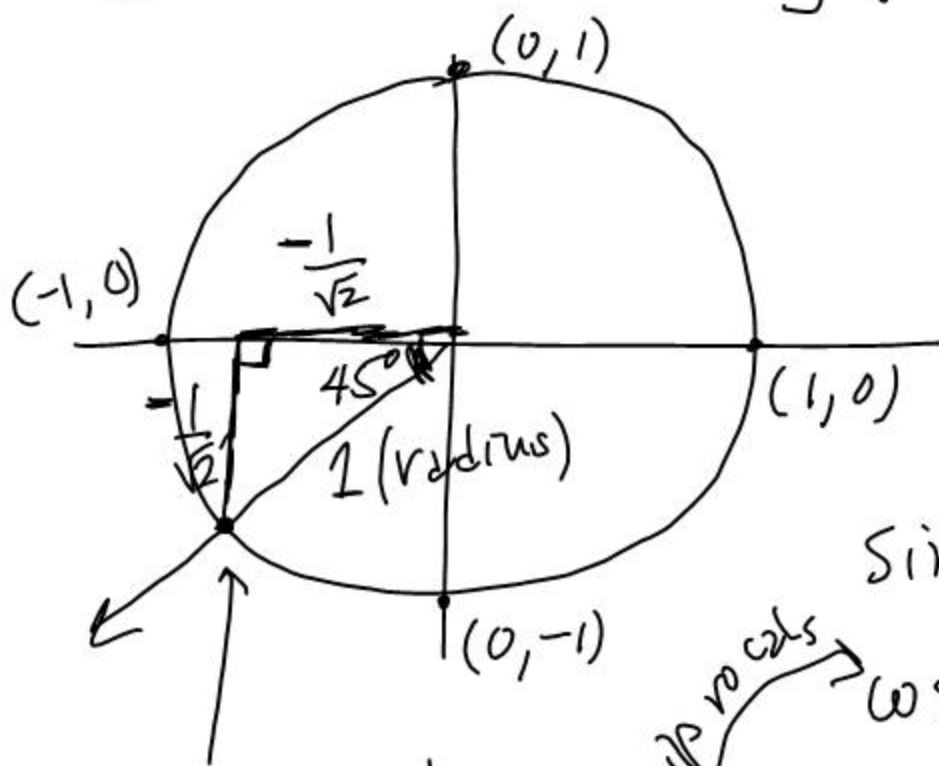
# 19.  $\tan 30^\circ = \frac{1}{\sqrt{3}}$

# 10.  $\tan \frac{\pi}{6} = \frac{1}{\sqrt{3}}$

## Definition of Sine & Cosine



Evaluate all 6 trig functions for  $225^\circ$ .



$$\sin 225^\circ = -\frac{1}{\sqrt{2}}$$

$$\cos 225^\circ = -\frac{1}{\sqrt{2}}$$

$$\tan 225^\circ = \frac{-\frac{1}{\sqrt{2}}}{-\frac{1}{\sqrt{2}}} = 1$$

$$\cot 225^\circ = 1$$

$$\sec 225^\circ = -\sqrt{2}$$

$$\csc 225^\circ = -\sqrt{2}$$

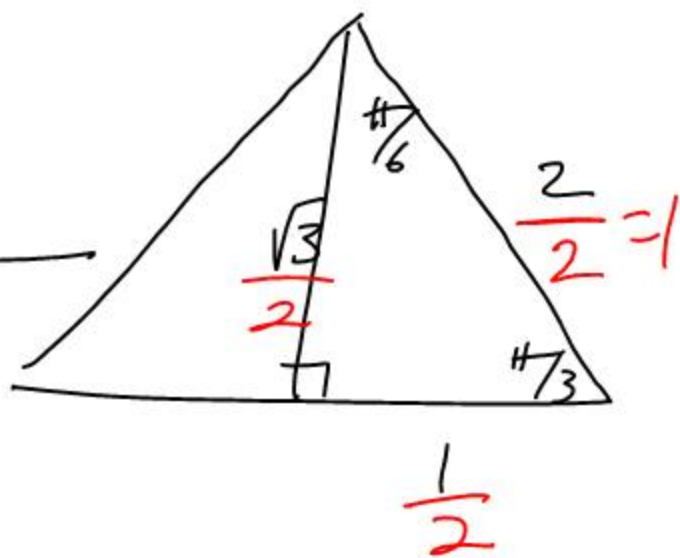
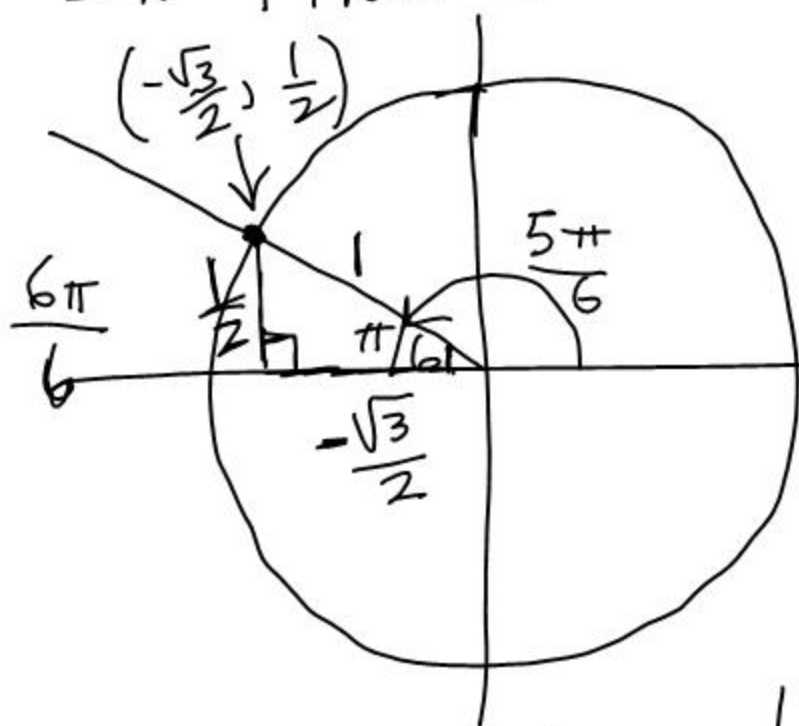
(recip. of sine)

$$\left(-\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\right)$$

reciprocals

reciprocals

Ex Find all 6 trig functions for  $\frac{5\pi}{6}$ .



$$\sin \frac{5\pi}{6} = \frac{1}{2}$$

$$\cos \frac{5\pi}{6} = -\frac{\sqrt{3}}{2}$$

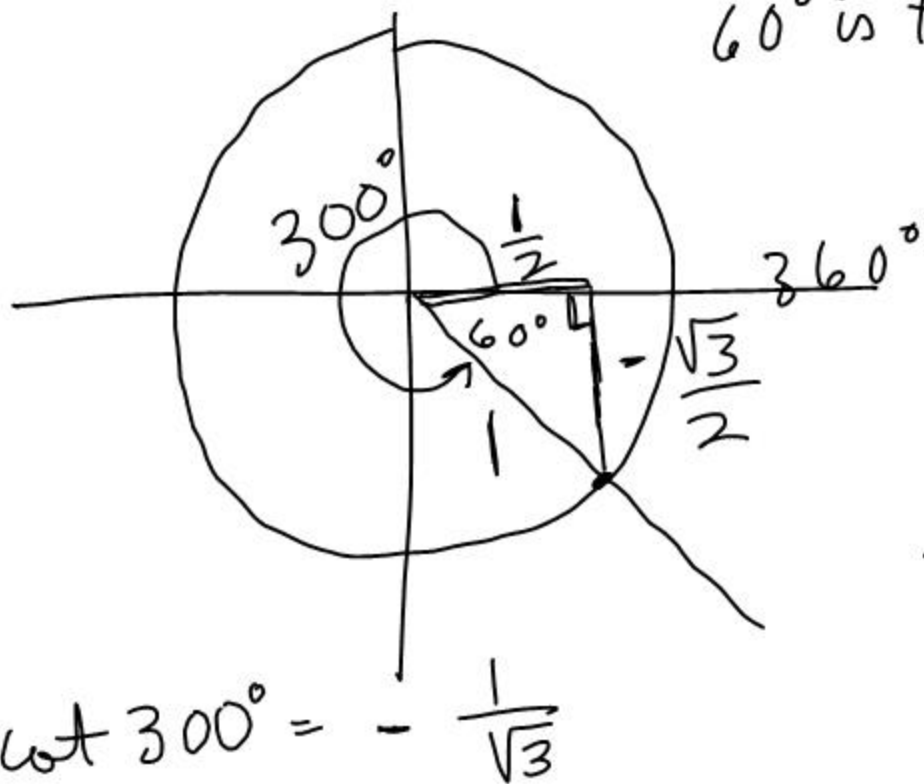
$$\tan \frac{5\pi}{6} = \frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}} = -\frac{1}{\sqrt{3}}$$

$$\cot \frac{5\pi}{6} = -\sqrt{3}$$

$$\sec \frac{5\pi}{6} = -\frac{2}{\sqrt{3}}$$

$$\csc \frac{5\pi}{6} = 2$$

Ex. Find all 6 trig functions for  $300^\circ$   
 $60^\circ$  is the reference angle



$$\sin 300^\circ = \frac{-\sqrt{3}}{2}$$

$$\cos 300^\circ = \frac{1}{2}$$

$$\tan 300^\circ = \frac{-\sqrt{3}}{\frac{1}{2}}$$

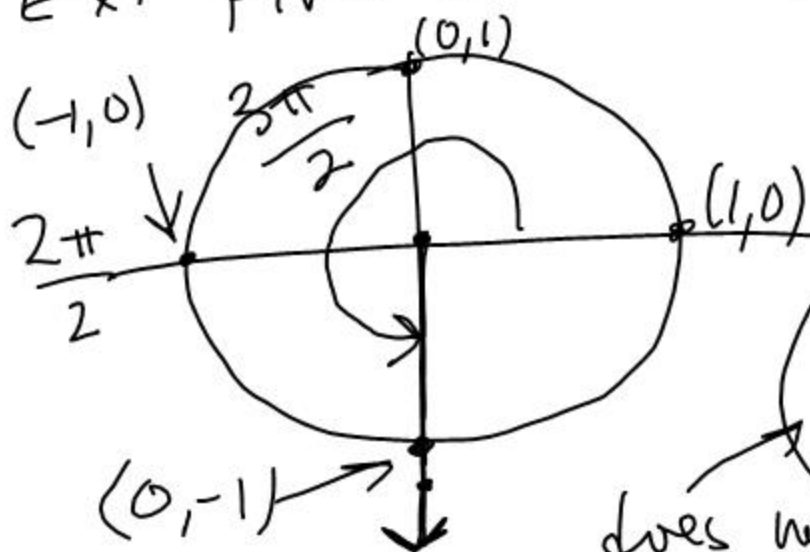
$$= -\sqrt{3}$$

$$\cot 300^\circ = -\frac{1}{\sqrt{3}}$$

$$\sec 300^\circ = 2$$

$$\csc 300^\circ = \frac{-2}{\sqrt{3}}$$

Ex. Find all 6 trig functions for  $\frac{3\pi}{2}$



$$\sin \frac{3\pi}{2} = -1 \text{ (y-coordinate)}$$

$$\cos \frac{3\pi}{2} = 0 \text{ (x-coordinate)}$$

$$\tan \frac{3\pi}{2} = \frac{\sin \frac{3\pi}{2}}{\cos \frac{3\pi}{2}}$$

does not exist =  $-\frac{1}{0}$

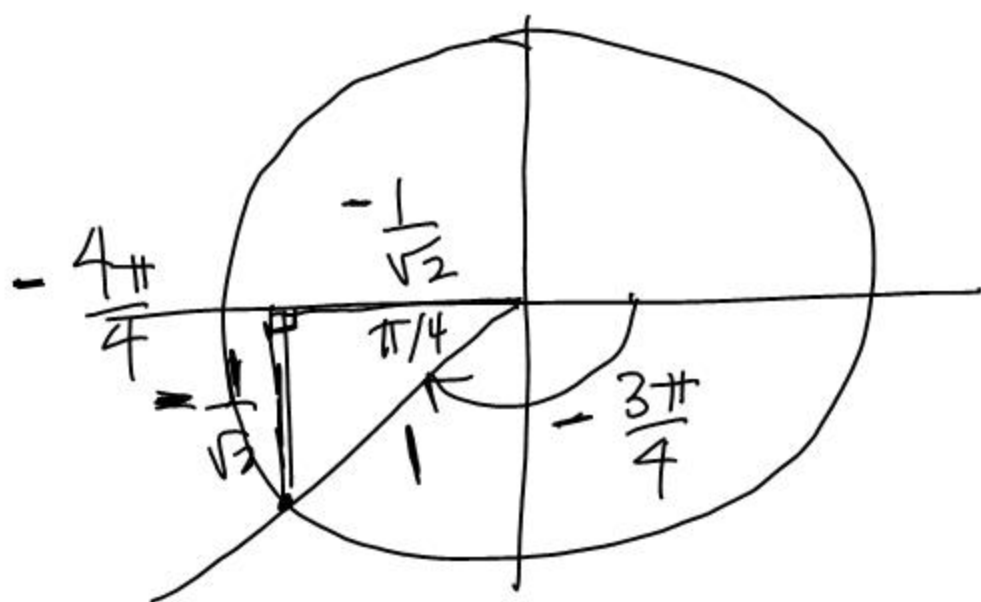
$$\cot \frac{3\pi}{2} = \frac{\cos \frac{3\pi}{2}}{\sin \frac{3\pi}{2}} = \frac{0}{-1} = 0$$

$$\text{sec } \frac{3\pi}{2} = \frac{1}{\cos \frac{3\pi}{2}} = \frac{1}{0}$$

dne

$$\csc \frac{3\pi}{2} = \frac{1}{\sin \frac{3\pi}{2}} = \frac{1}{-1} = -1$$

Ex. Find  $\csc \left( -\frac{3\pi}{4} \right) = \frac{1}{-\frac{1}{\sqrt{2}}} \text{ (hyp)}$   
 $\text{ (opp)}$



$$= -\sqrt{2}$$