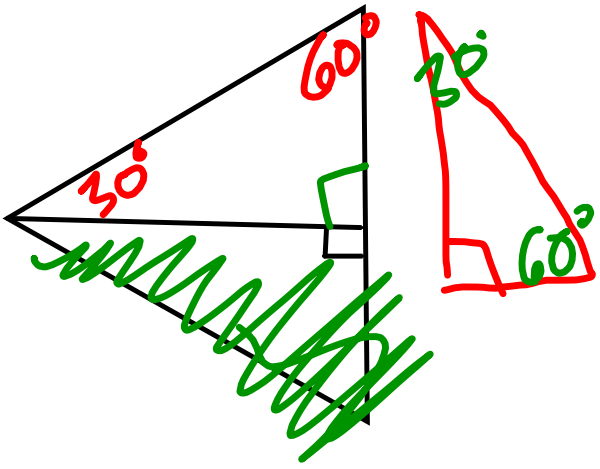
# 6-3 Trigonometric Ratios and the Unit Circle

## Objectives:

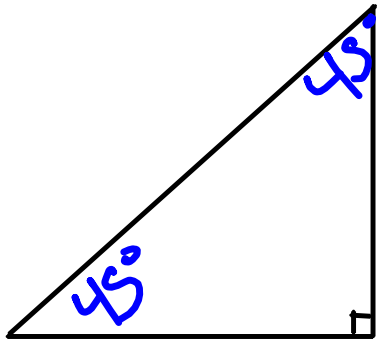
6-3a: I can evaluate trigonometric expressions using the unit circle.

# Special Triangles

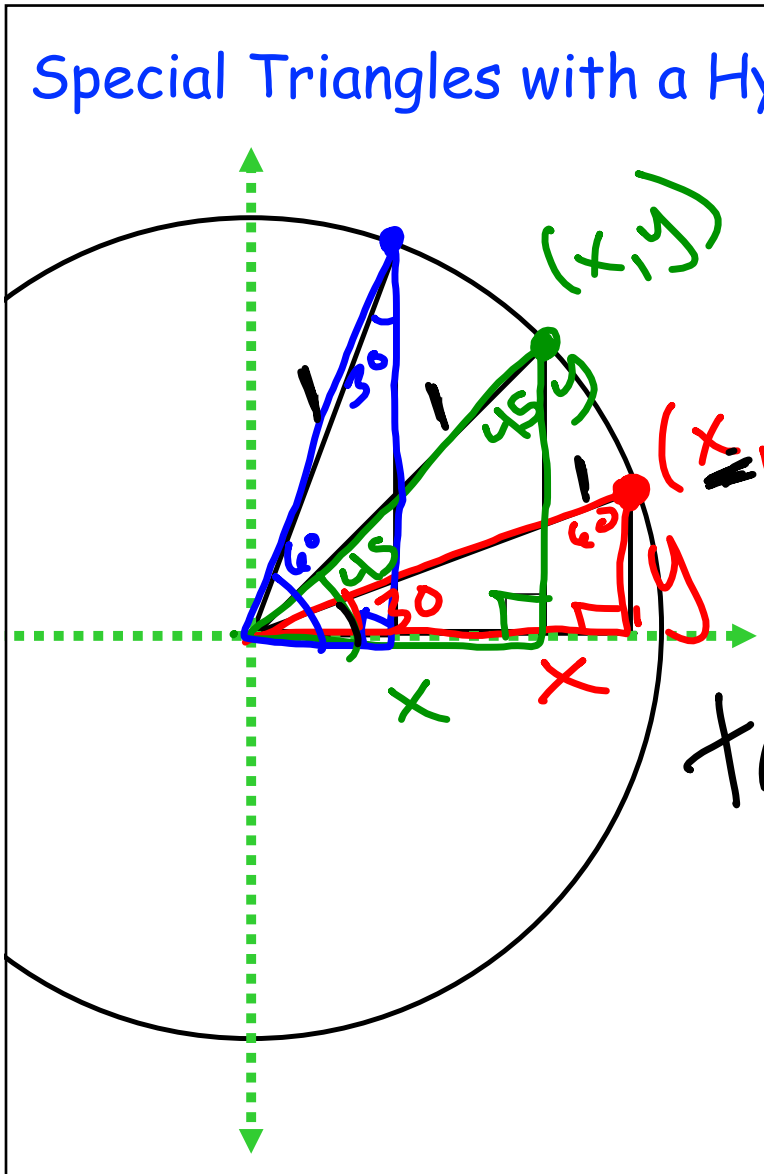
$30^\circ - 60^\circ - 90^\circ$




$45^\circ - 45^\circ - 90^\circ$



# Special Triangles with a Hypotenuses of 1




$\sin\theta = y$

$\cos\theta = x$

$\tan\theta = \frac{y}{x}$

$$\tan 30 = \frac{y}{x}$$

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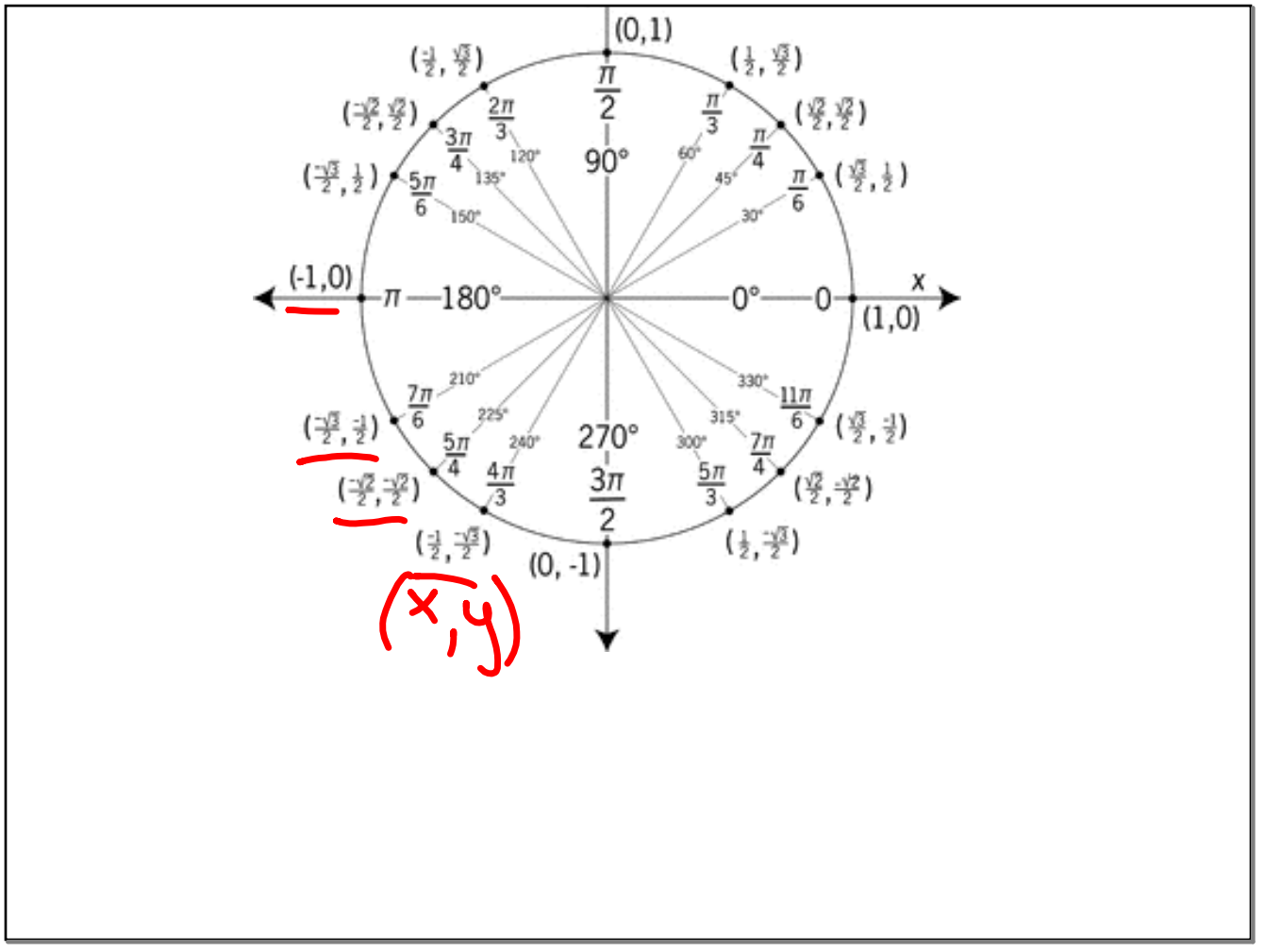
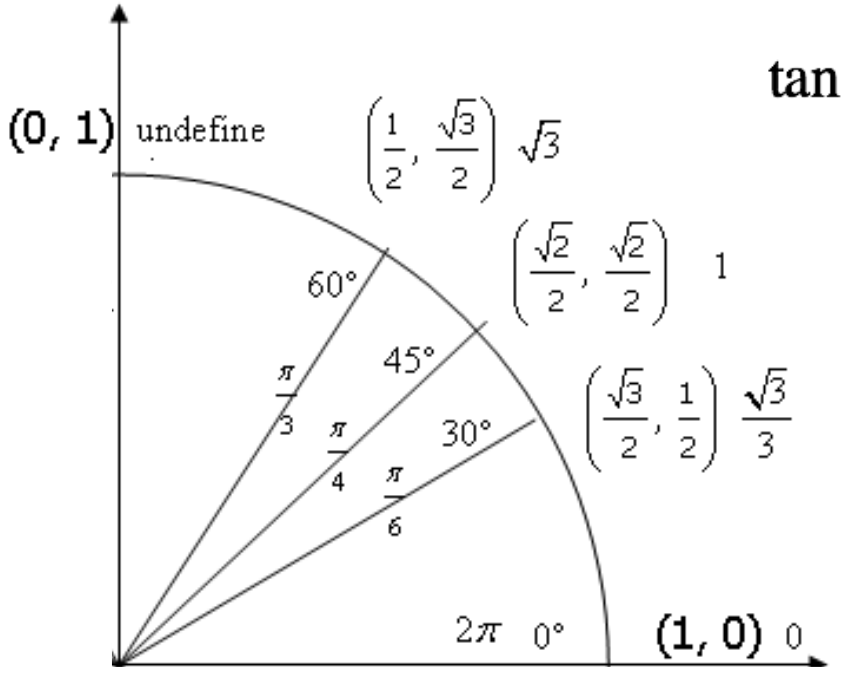


# UNIT CIRCLE

$(\cos\theta, \sin\theta)$

$$\tan\theta = \frac{\sin\theta}{\cos\theta}$$



## Evaluate the following

$\sin \pi =$ 0

$(-1, 0)$

$\csc \frac{5\pi}{4} = \frac{2}{-\sqrt{2}}$

$\sin \frac{5\pi}{4} = -\frac{\sqrt{2}}{2}$

$\cos \frac{3\pi}{4} = \frac{-\sqrt{2}}{2}$

$\sec \frac{\pi}{6} =$

$\tan \frac{11\pi}{6} = \frac{-\sqrt{3}}{3}$

$\cot \frac{\pi}{3} =$

$\tan \frac{13\pi}{6} = \frac{\sqrt{3}}{3}$ $\cos(-300°)$

$\frac{13\pi}{6} - \frac{12\pi}{6} = \frac{\pi}{6}$

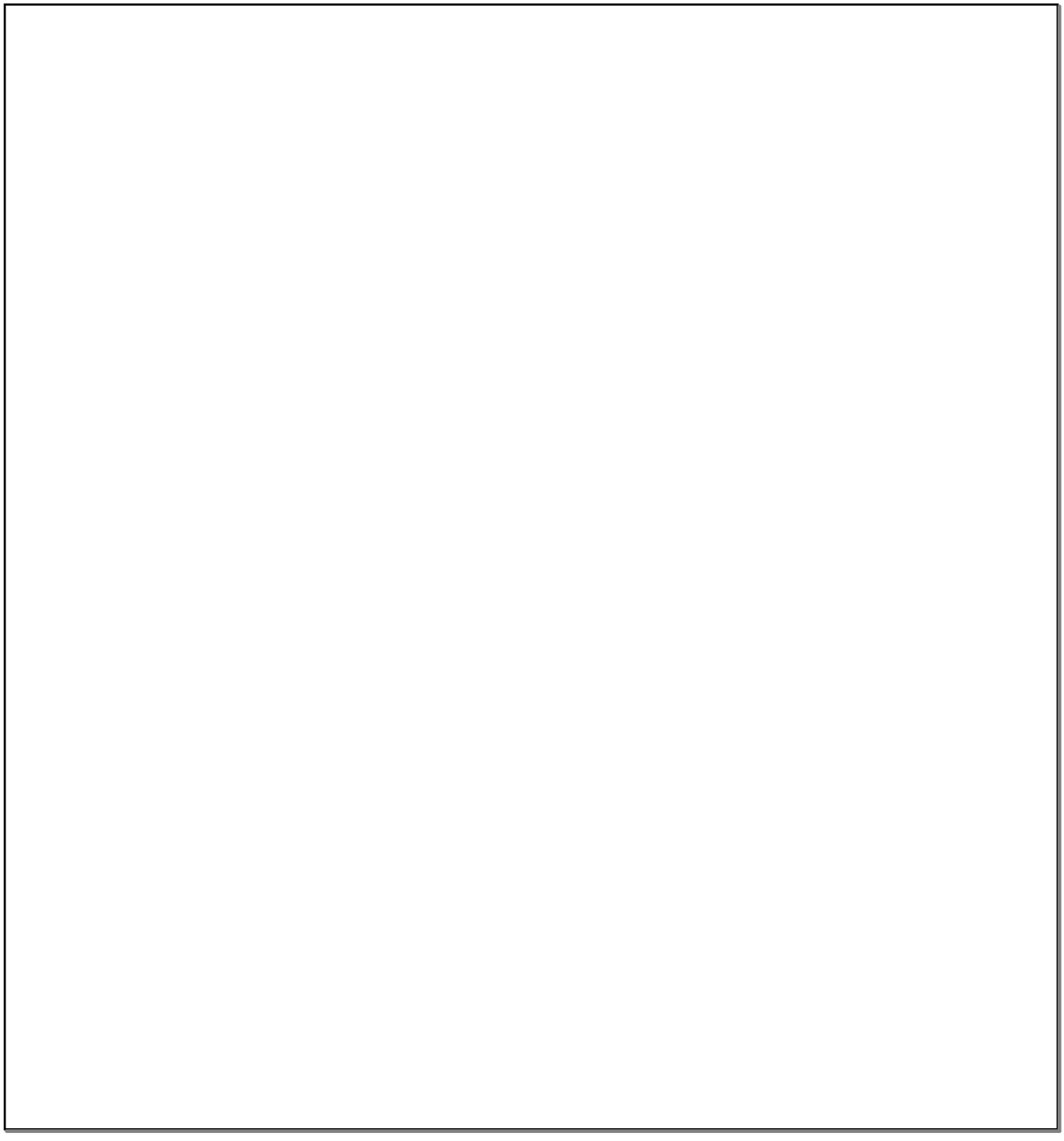
$\tan \frac{\pi}{6} = \frac{\sqrt{3}}{3}$

## Evaluate the following

$$\sin\frac{13\pi}{4}$$

$$\csc\frac{19\pi}{6}$$

$$\tan\left(-\frac{\pi}{4}\right)$$

$$\sec\left(-\frac{3\pi}{2}\right)$$

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