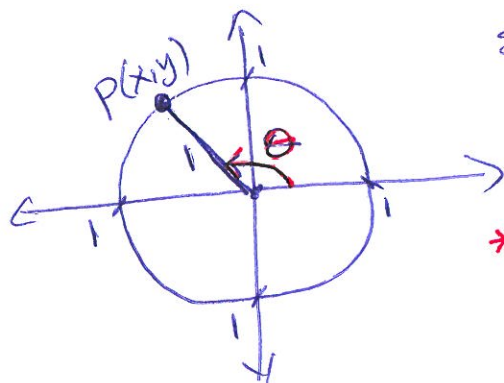


Trigonometric Functions on the Unit Circle



$$\sin \theta = \frac{y}{r} = \frac{y}{1} = y$$

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

* $r=1$ on unit circle

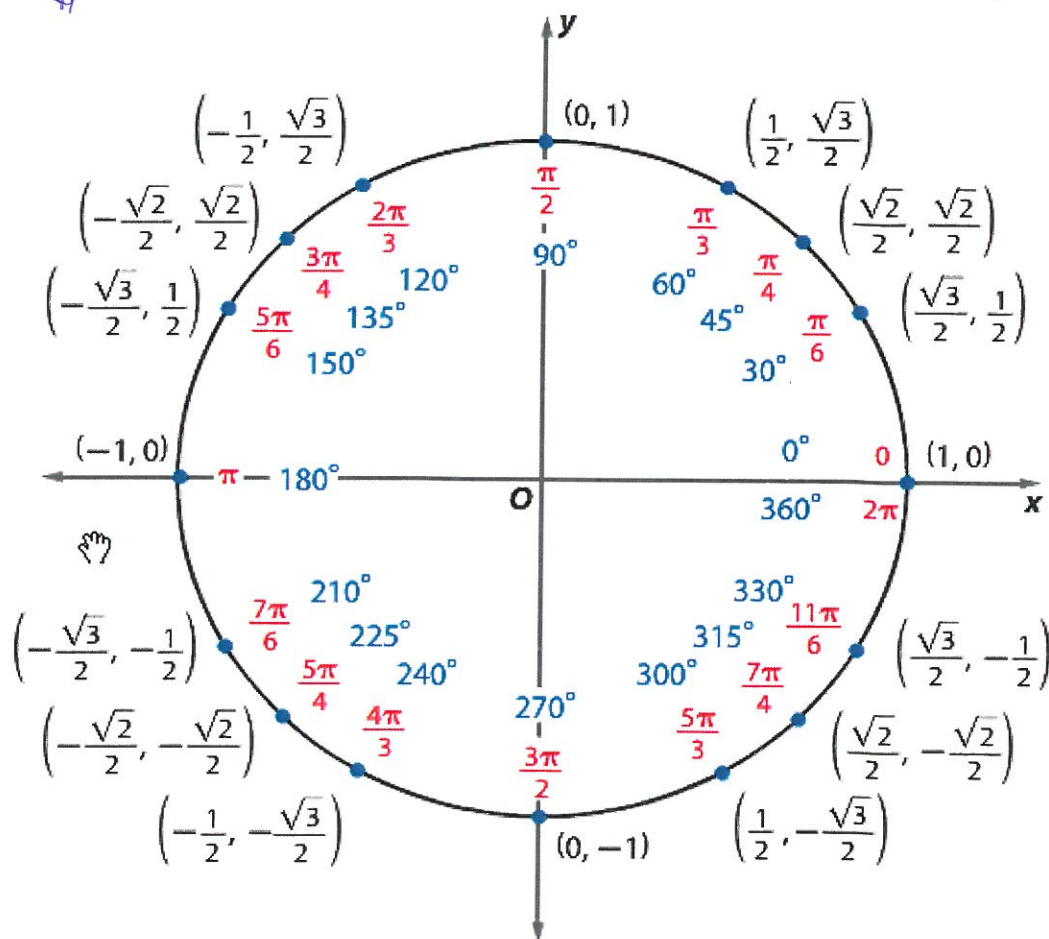
$$\tan \theta = \frac{y}{x}, x \neq 0$$

$$\cot \theta = \frac{x}{y}, y \neq 0$$

$$\sec \theta = \frac{1}{x}, x \neq 0$$

$$\csc \theta = \frac{1}{y}, y \neq 0$$

16-Point Unit Circle



Examples: Use the unit circle to find the trig values for the following functions.

$$\sin \frac{7\pi}{6} = \underline{y = -\frac{1}{2}} \quad \cos 300^\circ = \underline{x = \frac{1}{2}} \quad \tan \frac{2\pi}{3} = \underline{\frac{y}{x} = \frac{\sqrt{3}/2}{-1/2} = -\sqrt{3}}$$

$$\cot 60^\circ = \underline{\frac{x}{y} = \frac{\sqrt{3}}{3}} \quad \sec \frac{5\pi}{4} = \underline{\frac{1}{x} = \frac{1}{-\sqrt{2}/2} = -\sqrt{2}} \quad \csc 150^\circ = \underline{\frac{1}{y} = \frac{1}{1/2} = 2}$$