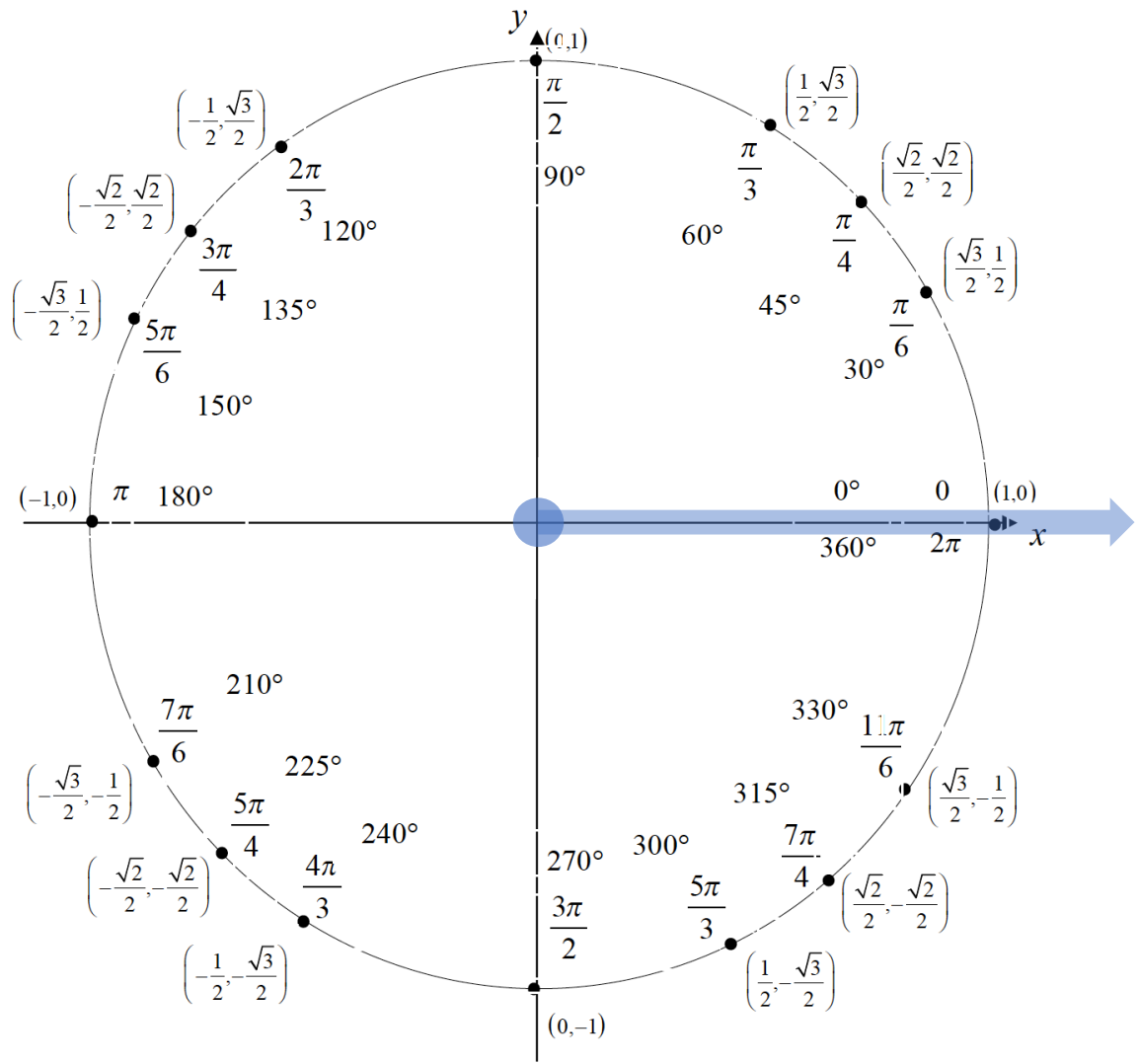


Unit Circle and Circular Formulas

Use the unit circle diagram and the **terminal point** (x, y) associated with the **central angle** θ and **arc length** s .

Unit Circle



Circular Functions

$$\sin(\theta) = \sin(s) = y$$

$$\cos(\theta) = \cos(s) = x$$

$$\tan(\theta) = \tan(s) = \frac{y}{x}$$

Reciprocal Functions

$$\sec(\theta) = \sec(s) = \frac{1}{y}$$

$$\csc(\theta) = \csc(s) = \frac{1}{x}$$

$$\cot(\theta) = \cot(s) = \frac{x}{y}$$

Negative Angles

$$\sin(-\theta) = \sin(-s) = -y$$

$$\cos(\theta) = \cos(s) = x$$

$$\tan(-\theta) = \tan(-s) = -\frac{y}{x}$$

Even and Odd Functions

$$\sin(-\theta) = -\sin(\theta); \text{ odd}$$

$$\cos(-\theta) = \cos(\theta); \text{ even}$$

$$\tan(-\theta) = -\tan(\theta); \text{ odd}$$

Pythagorean Identities

$$\cos^2(\theta) + \sin^2(\theta) = 1$$

$$1 + \tan^2(\theta) = \sec^2(\theta)$$

$$\cot^2(\theta) + 1 = \csc^2(\theta)$$