The Unit Circle - Part I

Preliminaries and Objectives

Preliminaries:
- Measurement of angles in degrees
- Cartesian Coordinate System

Objectives:
- Define the functions $\sin$ and $\cos$
- Find values of $\cos \theta$ and $\sin \theta$ if $\theta$ is a multiple of $90^\circ$

Associating Angles and Points
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-1, 0 180°

x

y

(1, 0) 360°

x

y

270°

(0, -1)

0°

(1, 0)

x

y
### Associating Angles and Points

- The Unit Circle

\[
\begin{align*}
\cos 180^\circ &= -1 \\
\sin 90^\circ &= 1 \\
\cos 0^\circ &= 1 \\
\sin 180^\circ &= 0 \\
\sin 270^\circ &= -1 \\
\cos 90^\circ &= 0 \\
\cos 360^\circ &= 1 \\
\cos 270^\circ &= 0 \\
\sin 0^\circ &= 0 \\
\cos -90^\circ &= 0 \\
\sin 360^\circ &= 0 \\
\sin -90^\circ &= -1
\end{align*}
\]

### Recap

- Angles \( \theta \) are measured counterclockwise from the positive side of the \( x \)-axis.
- \( \cos \theta \) is the \( x \)-coordinate of the point on the unit circle associated with the angle.
- \( \sin \theta \) is the \( y \)-coordinate of the point on the unit circle associated with the angle.