Sinusoidal Functions

Sine vs. Negative Sine

\[
\begin{array}{|c|c|c|c|c|}
\hline
x & 0 & \frac{\pi}{2} & \pi & \frac{3\pi}{2} & 2\pi \\
\hline
y = \sin(x) & 0 & 1 & 0 & -1 & 0 \\
\hline
\end{array}
\]

Period: \(2\pi\)

Midline: \(y = 0\)

Amplitude: 1

Starting Position: midline

\[
\begin{array}{|c|c|c|c|c|}
\hline
x & 0 & \frac{\pi}{2} & \pi & \frac{3\pi}{2} & 2\pi \\
\hline
y = -\sin(x) & 0 & -1 & 0 & 1 & 0 \\
\hline
\end{array}
\]

Period: \(2\pi\)

Midline: \(y = 0\)

Amplitude: 1

Starting Position: midline
### Cosine vs. Negative Cosine

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>$\frac{\pi}{2}$</th>
<th>$\pi$</th>
<th>$\frac{3\pi}{2}$</th>
<th>$2\pi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y = \cos(x)$</td>
<td>1</td>
<td>0</td>
<td>-1</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

**Period:** $2\pi$

**Midline:** $y = 0$

**Amplitude:** 1

**Starting Position:** maximum

<table>
<thead>
<tr>
<th>$x$</th>
<th>0</th>
<th>$\frac{\pi}{2}$</th>
<th>$\pi$</th>
<th>$\frac{3\pi}{2}$</th>
<th>$2\pi$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$y = -\cos(x)$</td>
<td>-1</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>-1</td>
</tr>
</tbody>
</table>

**Period:** $2\pi$

**Midline:** $y = 0$

**Amplitude:** 1

**Starting Position:** minimum