Announcements

- Test 2 on Friday, covering through 6.8
- Practice test posted
- Labs 3,4 Homework 3,4 must be done by Friday

The Graph of $y = \tan x$

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>$-\pi/3$</td>
<td>$-\sqrt{3} \approx -1.73$</td>
</tr>
<tr>
<td>$-\pi/4$</td>
<td>$-1$</td>
</tr>
<tr>
<td>$-\pi/6$</td>
<td>$-\sqrt{3}/3 \approx -0.58$</td>
</tr>
<tr>
<td>$0$</td>
<td>$0$</td>
</tr>
<tr>
<td>$\pi/6$</td>
<td>$\sqrt{3}/3 \approx 0.58$</td>
</tr>
<tr>
<td>$\pi/4$</td>
<td>$1$</td>
</tr>
<tr>
<td>$\pi/3$</td>
<td>$\sqrt{3}$</td>
</tr>
</tbody>
</table>
Characteristics of the Tangent Function

1. Domain: all real numbers, except odd multiples of $\frac{\pi}{2}$.
2. Range: all real numbers.
3. Odd (symmetric with respect to the origin).
4. Periodic, with period $\pi$.
5. The $x$-intercepts are $\ldots, -2\pi, -\pi, 0, \pi, 2\pi, \ldots$; the $y$-intercept is 0.
6. Vertical asymptotes occur at $x = \ldots, -\frac{3\pi}{2}, -\frac{\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}, \ldots$. 
The graphs of the sine and cosine functions are called **sinusoidal graphs**.
**Theorem**

If \( \omega > 0 \), the amplitude and period of \( y = A \sin \omega x \) and \( y = A \cos \omega x \) are given by

\[
\text{Amplitude} = |A| \quad \text{Period} = T = \frac{2\pi}{\omega}
\]

Determine the amplitude and period of \( y = -2 \sin 2x \), and graph the function.

\[
y = -2 \sin 2x \\
y = A \sin \omega x \\
A = -2, \ \omega = 2 \\
\text{Amplitude} = |-2| = 2 \\
T = \frac{2\pi}{\omega} = \frac{2\pi}{2} = \pi
\]
$$y = \sin 2x$$

$$y = -2 \sin 2x$$