To graph \( y = \sin \theta \) we will have to remember several values of the sine function.

<table>
<thead>
<tr>
<th>Degrees</th>
<th>0</th>
<th>30</th>
<th>45</th>
<th>60</th>
<th>90</th>
<th>120</th>
<th>135</th>
<th>150</th>
<th>180</th>
<th>210</th>
<th>225</th>
<th>240</th>
<th>270</th>
<th>300</th>
<th>315</th>
<th>330</th>
<th>360</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radians</td>
<td>0</td>
<td>( \frac{\pi}{6} )</td>
<td>( \frac{\pi}{4} )</td>
<td>( \frac{\pi}{3} )</td>
<td>( \frac{\pi}{2} )</td>
<td>( \frac{2\pi}{3} )</td>
<td>( \frac{5\pi}{6} )</td>
<td>( \pi )</td>
<td>( \frac{7\pi}{6} )</td>
<td>( \frac{4\pi}{3} )</td>
<td>( \frac{3\pi}{2} )</td>
<td>( \frac{5\pi}{3} )</td>
<td>( \frac{2\pi}{3} )</td>
<td>( \frac{\pi}{2} )</td>
<td>( \frac{5\pi}{6} )</td>
<td>( 2\pi )</td>
<td></td>
</tr>
<tr>
<td>( \sin \theta )</td>
<td>0</td>
<td>( \frac{1}{2} )</td>
<td>( \frac{\sqrt{3}}{2} )</td>
<td>1</td>
<td>( \frac{\sqrt{3}}{2} )</td>
<td>( \frac{1}{2} )</td>
<td>0</td>
<td>( -\frac{\sqrt{3}}{2} )</td>
<td>( -1 )</td>
<td>( -\frac{\sqrt{3}}{2} )</td>
<td>( -\frac{1}{2} )</td>
<td>0</td>
<td>( \frac{1}{2} )</td>
<td>( \frac{\sqrt{3}}{2} )</td>
<td>1</td>
<td>( \frac{\sqrt{3}}{2} )</td>
<td>( \frac{1}{2} )</td>
</tr>
</tbody>
</table>

For Homework you will follow the above example and graph the Cosine function.
Sine and Cosine are called **Periodic Functions** because their basic shape repeats every $360^\circ$ or $2\pi$ radians. The period for these two functions is therefore, $360^\circ$ or $2\pi$ radians. Think of the Sine curve as a horizontal "S" shape and Cosine as a "U" shape.

Let's look at general Sine and Cosine functions and their graphs:

$$y = A \sin B\theta$$
$$y = A \cos B\theta$$

$A$ represents the **Amplitude** of the graph, this is half the difference between the maximum and minimum values. If $A$ is a negative number, your graph is reflected across the $x$-axis.

$B$ helps you find the period of the graph. To calculate the period, divide $360^\circ$ or $2\pi$ by the absolute value of $B$, $|B|$.

Let's look at some characteristics of the Sine graph:

1) at $0^\circ$ or 0 radians its value is 0
2) at one fourth of its period it reaches its maximum value
3) half way through its period it is 0
4) three fourths of its period it reaches its minimum value
5) at the end of its period it is again 0
6) if $A$ is negative, the placement of the maximum and minimum values are reversed (a reflection across the $x$-axis).
Ex 1) Sketch the graph of: \( y = 3 \sin 2\theta \).

Amplitude = 3
Period = 180° or \( \pi \) radians

Ex 2) Sketch the graph of: \( y = -\frac{1}{2} \sin \frac{1}{2} \theta \)

Amplitude = 1/2
Period = 720° or 4\( \pi \)
Negative sign creates reflection of graph over x-axis.
Let's look at some characteristics of the Cosine graph:
1) at 0° or 0 radians it reaches its maximum value
2) at one fourth of its period it is 0 (zero)
3) half way through its period it reaches its minimum value
4) three fourths of its period it is 0 (zero) again
5) at the end of its period it reaches its maximum value again
6) if $A$ is negative, the placement of the maximum and minimum values are reversed (a reflection across the x-axis).

Ex 3) Sketch the graph of: $y = 4 \cos 2\theta$

Amplitude = 4
Period = 180° or $\pi$
Ex 4) Sketch the graph of: \[ y = -\frac{3}{4} \cos \frac{1}{3} \theta \]

Amplitude = $3/4$
Period = $1080^\circ$ or $6\pi$