SECTION ONE

UNIT CIRCLE AND ITS EQUATION: In a rectangular coordinate system, the circle centered at the origin with a radius of 1 unit is called “unit circle”. The circumference of the unit circle is \(2\pi\).

Any point \(P(x,y)\) on the unit circle satisfies the equation \(x^2+y^2=1\).

Exercise: Find the \(x\)- and \(y\)-intercepts of the unit circle.

UNITS OF MEASUREMENTS FOR ANGLES: An angle is determined by its direction (counterclockwise or clockwise) and magnitude.

- \(360^\circ\) degrees: A positive angle of one full revolution has measure \(360^\circ\).
- \(2\pi\) radians: One full revolution corresponds to an arclength of \(2\pi\) radians.

Therefore, \(360^\circ=2\pi\) rad

<table>
<thead>
<tr>
<th>Degree measure</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>270</th>
<th>360</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radian Measure</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{3\pi}{4})</td>
<td>(\frac{5\pi}{6})</td>
<td>(\pi)</td>
<td>(\frac{3\pi}{2})</td>
<td>(2\pi)</td>
</tr>
</tbody>
</table>

Ex: Convert \(100^\circ\) into radians. Ans: \(100^\circ=\left(\frac{100}{360}\right)\times2\pi=\frac{5\pi}{9}\) rad

Ex: Convert \(\frac{4\pi}{7}\) radians into degrees. Ans: \(\frac{4\pi}{7}\) rad=\((\frac{4\pi}{7}/2\pi)\times360=(720/7)^\circ\)