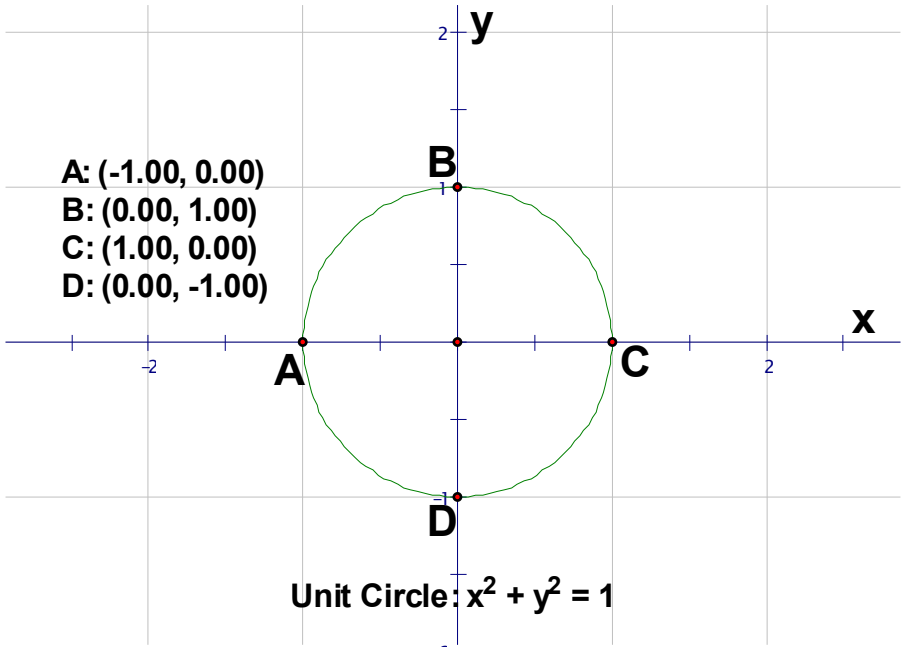
**SECTION ONE**

**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.

$360^o$ degrees: A positive angle of one full revolution has measure $360^o$ .
$2\pi$ radians: One full revolution corresponds to an arclength of $2\pi$ radians.

Therefore, $360^o=2\pi\,\text{rad}$

| Degree measure | 0 | 30 | 45 | 60 | 90 | 120 | 135 | 150 | 180 | 270 | 360 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Radian Measure | $0$ | $\frac{\pi}{6}$ | $\frac{\pi}{4}$ | $\frac{\pi}{3}$ | $\frac{\pi}{2}$ | $\frac{2\pi}{3}$ | $\frac{3\pi}{4}$ | $\frac{5\pi}{6}$ | $\pi$ | $\frac{3\pi}{2}$ | $2\pi$ |

Ex: Convert $100^o$ into radians. Ans: $100^o=(\frac{100}{360})\times 2\pi=\frac{5\pi}{9}\,\text{rad}$

Ex: Convert $\frac{4\pi}{7}$ radians into degrees. Ans: $\frac{4\pi}{7}\,\text{rad}=(\frac{4\pi}{7}/2\pi)\times 360=(720/7)^o$