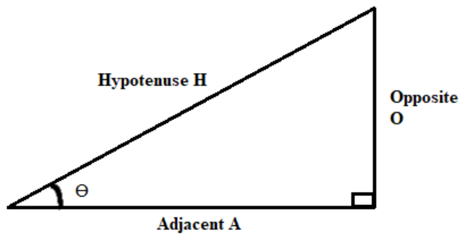
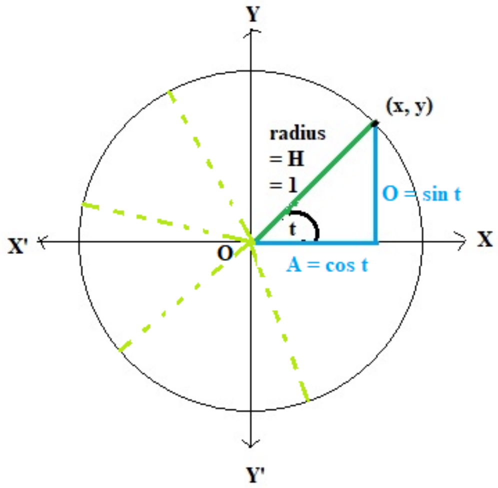


Pythagoras theorem states that a **triangle** is **right angled** IF and only if $\mathbf{H^2 = O^2 + A^2}$. **Trigonometry** is a branch of mathematics that studies relationships between lengths and angles of triangles. **Trigonometric ratios** provide these relationships. The following table summarizes these trigonometric ratios or **functions**, as they are also known. As these are ratios, they don't have any units.

Trigonometric ratio		
Name	**Ratio**	**Notation**
Sine	Opp/hyp O/H	sin(Θ)
Cosine	Adj/hyp A/H	cos(Θ)
Tangent	Opp/Adj O/A	tan(Θ)
Cosecant	Hyp/opp H/O	csc(Θ)
Secant	Hyp/Adj H/A	sec(Θ)
Cotangent	Adj/Opp A/O	cot(Θ)



The same concepts can be visualized in a circle of **radius** of **1**, centered at the **origin**, called a **unit circle**. Imagine a point **(x, y)** on the circle. It starts from the **x axis** and travels in the **counter-clockwise** direction (just to keep the angles positive). Imagine that it is covering **one full rotation**; the central angle (in radians) increases from **0 degrees (0 radians)** to **360 degrees (2π radians)** after the rotation when the point returns to its starting place on the x axis. The **radius** joining **(x, y)** to the **origin O** that forms **angle t** with the **x axis** forms the **hypotenuse** of the **right triangle** shown in the figure. The length of the opposite side (blue O) is **y** units whereas the length of the adjacent side A is **x** units.

Remember that **sin t = O/H = y/radius = y/1 = y units**

cos t = A/H = x/radius = x/1 = x units

tan t = O/A = y/x units