

Trigonometry 10: Pythagorean Identities, Part I

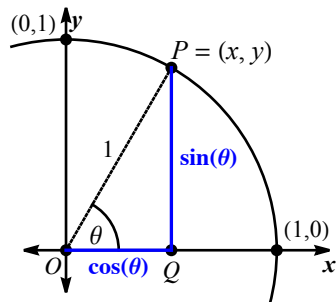
A **trigonometric identity** is an equality (a true equation) involving a trigonometric function. A trigonometric identity is true for all values in the function's domain. Our first identity is called a **Pythagorean identity** because it involves the Pythagorean Theorem.

In the diagram below the definitions of sine and cosine are shown: $x = \cos \theta$ and $y = \sin \theta$. Triangle OPQ is a right triangle with side lengths x and y . Using the Pythagorean Theorem:

$$x^2 + y^2 = 1$$

By substituting our definitions of sine and cosine we get our first (of three) Pythagorean Identities:

$$\cos^2 \theta + \sin^2 \theta = 1$$



We'll be using this identity often to both solve trig problems and derive more trig identities.