

## 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 function's domain. Our first identity is called a **Pythagorean identity** because it involves the **Pythagorean Theorem**.

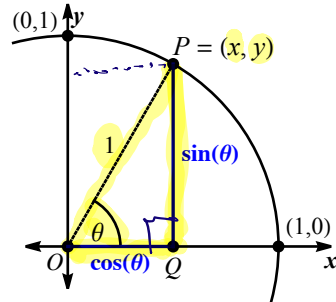
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In the diagram below the definitions of sine and cosine are shown:  $x = \cos \theta$  and  $y = \sin \theta$ . Triangle OPQ is a right triangle with side lengths  $x$  and  $y$ . Using the Pythagorean Theorem:

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

By the 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.