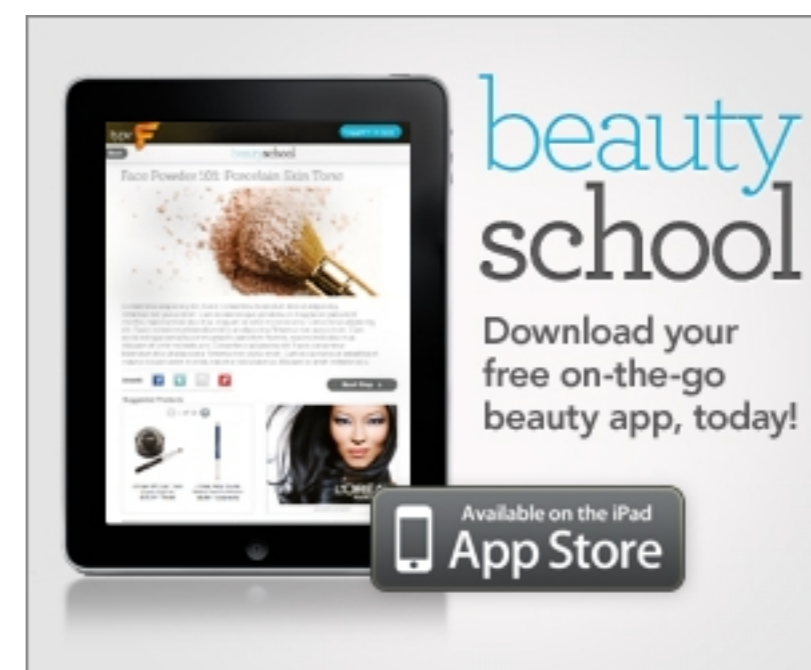


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Uses of Trigonometry in Math & Physics

By [Andrew Breslin](#), eHow Contributor | updated April 25, 2011

Trigonometry is the study of the relationship of sides and angles in a triangle. Mathematics students may wonder what use this is in the real world, where an abundance of right triangles is not readily apparent. They may be surprised to learn just how essential trigonometry is to modern science.



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Astronomy

Ancient astronomers discovered a technique called trigonometric parallax. To demonstrate, have one friend stand ten feet away from you, and another a hundred feet away. Now take a step to the right. The closer friend will appear to have moved much more than the distant one. Using trigonometry, and observing celestial bodies from two different vantage points separated by a known distance, early astronomers were able to accurately estimate distances to heavenly bodies. Trigonometry is still used extensively by astronomers today.

Electricity

Sine is the ratio of the length of the side opposite a given angle and the hypotenuse in a right triangle. If the angle is very small, then the length of the opposite side, and its ratio to the hypotenuse, will also be small. As the angle gets larger, the sine gets larger, reaches a maximum, then decreases until it reaches a minimum, and then repeats. If you were to graph the resulting sine on the y axis as a function of the angle on the x axis, you would get a wave. Alternating current is described by sine waves, so trigonometry is essential to understanding electricity.

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Electromagnetic Radiation

Light, microwaves, X-rays and radio signals are all described with sine waves. In fact, all these are examples of the same thing, electromagnetic radiation. The properties of the waves determine what type of radiation it is. Studying these types of radiation requires extensive trigonometric knowledge, as does any study of atomic structure, as on a sub-atomic scale, matter has wave-like properties.

Higher Mathematics

Although the area under study might have nothing to do with triangles, the trigonometric functions defined by those triangles make an appearance in many other areas of mathematics, including calculus and statistics. Essentially, anything that involves or can be described with waves, or involves periodic behavior, will ultimately use trigonometry in any deep analysis.

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