

# Trigonometric Functions I

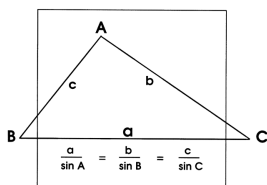
Math, Trigonometry

AIT 1988

6 10-minute program for grades 9-12

Math SOL: T.1, T.3, AII/T.21, AII/T.23, AII/T.29

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In this series, trigonometric functions are illustrated in a clear and dynamic format that makes full use of the advantages of computer animation. Methods of solving right-angled triangles, using the sine, cosine, and tangent ratios, are presented. The sine and cosine laws are then developed, and several examples involving oblique triangles are introduced and solved. The series ends with the application of the sine and cosine laws to some real-world situations.

**101. Trigonometric Ratios**—The three sides of a right-angled triangle are named in relation to a chosen angle: opposite, adjacent, and hypotenuse. Definitions are given for the trigonometric ratios of sine, cosine, and tangent in terms of the three named sides.

**Mathematics: T.1, AII/T.21**

**102. Solving Right Triangles**—Several examples of right-angled triangles in everyday life are introduced. The trigonometric ratios and the Pythagorean theorem provide expressions for the two unknown angles and the remaining side. Emphasis is placed on the ability to recognize the expressions for the trigonometric ratios in a right-angled triangle.

**Mathematics: T.1, AII/T.21, AII/T.24**

**103. Angles on the Plane**—The Cartesian plane and coordinate system is presented with a description of its numbering convention, and the concept of placing an angle in standard position is introduced, including the counterclockwise rotation of its terminal arm. Angles in the first quadrant are examined, and trigonometric ratios for these angles are found.

**Mathematics: T.3, AII/T.23**

**104. The Sine Law**—Methods of

solving oblique triangles are introduced through the development of the sine law. Several numerical examples are presented that will help students to recognize situations in which the application of the sine law is appropriate.

**Mathematics: T.3, AII/T.23**

**105. The Cosine Law**—Although the sine law can be used to solve many oblique triangles, it cannot solve them all. The cosine law as another method of solving is introduced and developed. Several triangles that cannot be solved by means of the sine law are shown.

**Mathematics: T.3, AII/T.23**

**106. Applications of Sine and Cosine Laws**—With the sine and cosine laws, the student now has all the tools to solve any triangle, whether right-angled or oblique.

Two numerical applications of these laws are demonstrated, including the two-step problem of finding the height of a cliff on the far side of a river.

**Mathematics: T.3, T.9, AII/T.23, AII/T.29**