Soh Cah Toa

Soh Cah Toa stands for Sin x= opposite/hypotenuse, Cos x= adjacent/hypotenuse, and Tan x= opposite/adjacent.

Applications

1. Angle of Elevation
The *angle of elevation* of an object as seen by an observer is the angle between the horizontal and the line from the object to the observer's eye (the line of sight)
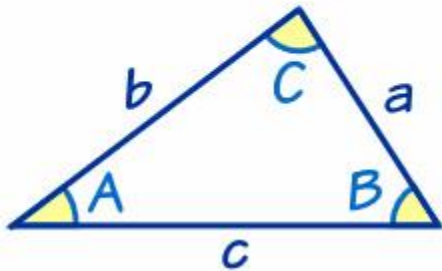
2. Angle of Depression
The word "depression" means "fall" or "drop".

Angle of depression is the angle between the horizontal and the line of sight to an object beneath the horizontal
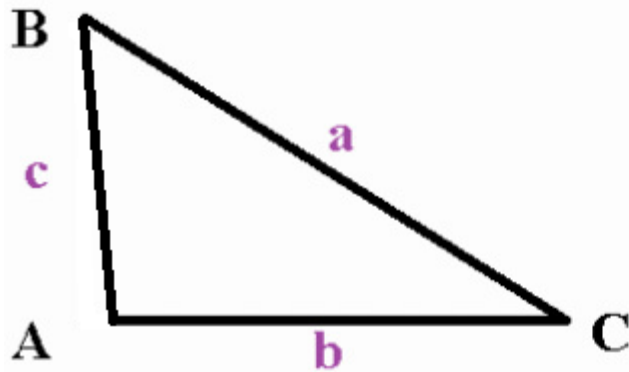
Law of Sines

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

The law of sines provides a formula that relates the sides with the angles of a triangle. This formula allows you to relatively easily find the side length or the angle of any triangle. If two sides and the angle opposite one of them are specified, then the angle opposite the other can be calculated. The third angle is then determined by the fact that the sum of the interior angles of a triangle must equal to 180 degrees.

a, b and c are sides.
A, B and C are angles.
(Side a faces angle A, side b faces angle B, and side c faces angle C).

law of cosines

$$a^2 = b^2 + c^2 - 2bc\cos(A)$$
$$b^2 = a^2 + c^2 - 2ac\cos(B)$$
$$c^2 = a^2 + b^2 - 2ab\cos(C)$$

The law of cosines for calculating one side of a triangle when the angle opposite and the other two sides are known. Can be used in conjunction with the law of sines to find all sides and angles.

$$\cos C = \frac{a^2 + b^2 - c^2}{2ab}$$

Solving for the cosines yields the equivalent formula

To evaluate inverse trig functions remember that the following statements are equivalent.

$\theta = \cos^{-1}(x) \Leftrightarrow x = \cos(\theta)$

$\theta = \sin^{-1}(x) \Leftrightarrow x = \sin(\theta)$

$\theta = \tan^{-1}(x) \Leftrightarrow x = \tan(\theta)$