

# Basic Trigonometry: Soh-Cah-Toa

## Soh-Cah-Toa

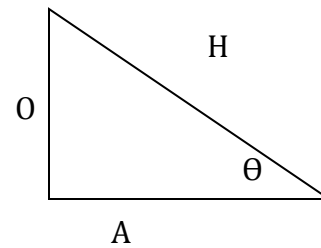
Soh-Cah-Toa is a helpful acronym to remember sin, cos, and tan for trigonometry. Below shows how helpful the acronym can be.

“ $\theta$ ” Means Angle

“O” Means Opposite with respect to  $\theta$

“A” Means Adjacent with respect to  $\theta$

“H” Mean Hypotenuse with respect to  $\theta$



$$\sin \theta = O/H$$

$$\csc \theta = 1/\sin \theta = H/O$$

$$\cos \theta = A/H$$

$$\sec \theta = 1/\cos \theta = H/A$$

$$\tan \theta = O/A$$

$$\cot \theta = 1/\tan \theta = A/O$$

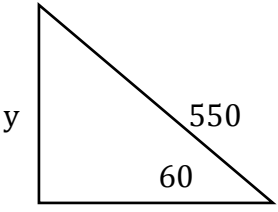
Degree/Radians	0 $2\pi$	30 $\pi/6$	45 $\pi/4$	60 $\pi/3$	90 $\pi/2$
Sin $\theta$	0	1/2	$\sqrt{2}/2$	$\sqrt{3}/2$	1
Cos $\theta$	1	$\sqrt{3}/2$	$\sqrt{2}/2$	1/2	0
Tan $\theta$	0	$1/\sqrt{3}$	1	$\sqrt{3}$	$\infty$ or UND
Csc $\theta$	$\infty$ or UND	2	$\sqrt{2}$	$2/\sqrt{3}$	1
Sec $\theta$	1	$2/\sqrt{3}$	$\sqrt{2}$	2	$\infty$ or UND
Cot $\theta$	$\infty$ or UND	$\sqrt{3}$	1	$1/\sqrt{3}$	0



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## Example

A spy plane is detected by a ground satellite, and the plane is 550 miles away with an angle of 60 degrees. How high is the plane from the ground?

Step 1  Draw a picture	
Step 2 Soh-Cah-Toa?	$\sin \theta = O/H$
Step 3 Plug and Solve	$\sin (60) = y/550$ $\sqrt{3}/2 = y/550$ $(550) \sqrt{3}/2 = y$ $275 \sqrt{3} = y$

