

Basic Right Triangle Trig

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What is right triangle trigonometry?

Definition: The study of the specific functions of the angles and side lengths of right triangles, as it relates to trigonometric ratios

Important Vocab: right triangle, angles, sine, cosine, tangent, opposite side, adjacent side, hypotenuse

To understand right triangle trig, you have to understand the terms it uses.



Hypotenuse: The side directly across from the right angle (90°)

Opposite: The side across from the reference angle (Angle A)

Adjacent: The side next to the reference angle

Right triangle trig uses ratios to show the relation between sides and angles. Those ratios are formed using the Trigonometric functions of Sine (sin), Cosine (cos), Tangent (tan), and their corresponding inverses of Cosecant (csc), Secant (sec), and Cotangent (cot). The inverse functions can also be referred to as Arcsine, Arccosine, and Arctangent, or \sin^{-1} , \cos^{-1} , \tan^{-1} .

To remember the trigonometric ratios, we can use a simple mnemonic; Soh Cah Toa

$$\boxed{\text{Soh}} \text{ is Sine} = \frac{\text{opposite}}{\text{Hypotenuse}}$$

$$\boxed{\text{Csc}} = \frac{\text{Hypotenuse}}{\text{opposite}}$$

$$\boxed{\text{Cah}} \text{ is Cosine} = \frac{\text{Adjacent}}{\text{Hypotenuse}}$$

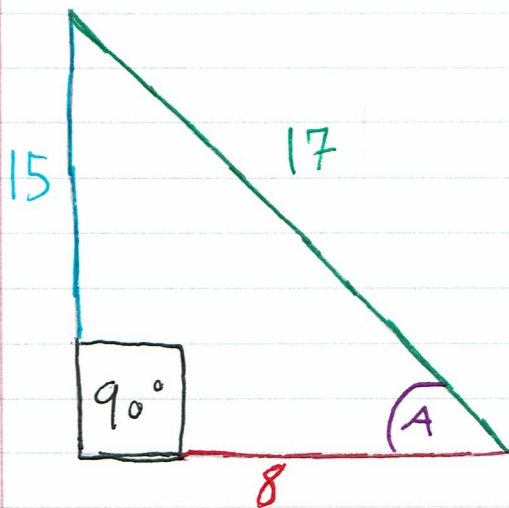
$$\boxed{\text{Sec}} = \frac{\text{Hypotenuse}}{\text{Adjacent}}$$

$$\boxed{\text{Toa}} \text{ is Tangent} = \frac{\text{opposite}}{\text{Adjacent}}$$

$$\boxed{\text{Cot}} = \frac{\text{Adjacent}}{\text{opposite}}$$

Inverse signs, no mnemonic for these

Given the right triangle, find the value of $\sin(A)$.



"A" is our reference angle. If we recall Soh Cah Toa, $\text{Sine} = \frac{O}{H}$. The opposite side is across from the reference angle, so $O = 15$. The hypotenuse is across from the right angle, so $H = 17$.

$$\sin(A) = \frac{15}{17}$$

Using the same triangle, find the values of $\cos(A)$, $\tan(A)$, $\csc(A)$, $\sec(A)$, and $\cot(A)$.

$$\cos(A) = \frac{8}{17}$$

$$\tan(A) = \frac{15}{8}$$

$$\csc(A) = \frac{17}{15}$$

$$\sec(A) = \frac{17}{8}$$

$$\cot(A) = \frac{8}{15}$$