

Monday, March 23, 2020

The Reciprocal Trig Functions

Still Sec 7-1



In triangle ABC, C is the right angle.

$$\text{Given Tan A} = \frac{11}{60}$$

Find the following as ratios:

$$\text{Cos A} =$$

$$\text{Tan B} =$$

$$\text{Sin A} =$$

$$\text{Cos B} =$$

$$\text{Sin B} =$$

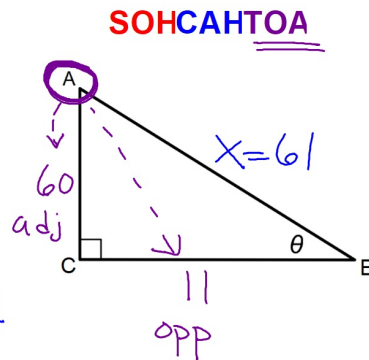
In $\triangle ABC$, C is the right angle.

$$\text{Given Tan A} = \frac{11}{60}$$

Step #1: draw and label $\triangle ABC$ with the given information.

Step #2: find the missing side.

$$X^2 = 11^2 + 60^2$$
$$X = \sqrt{11^2 + 60^2} = \underline{\underline{61}}$$



In $\triangle ABC$, C is the right angle.

$$\text{Given Tan A} = \frac{11}{60}$$

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Now that you have the lengths of all three sides you can find all these trig ratios.

Find the following as ratios:

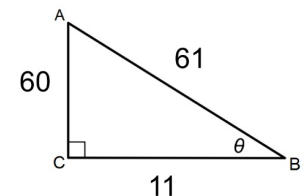
$$\text{Cos A} = \frac{60}{61}$$

$$\text{Tan B} = \frac{60}{11}$$

$$\text{Sin A} = \frac{11}{61}$$

$$\text{Cos B} = \frac{11}{61}$$

$$\text{Sin B} = \frac{60}{61}$$



Sine, Cosine, and Tangent are the three basic trigonometric functions, the building blocks of trig.

These three basic trig functions give rise to three other trig functions:

Reciprocal Trig Functions

Reciprocal Trig Functions

Secant

Cosecant

Cotangent

Just like with Sine, Cosine, and Tangent there are three letter abbreviations for the Reciprocal Trig Functions:

Secant → Sec

Cosecant → Csc

Cotangent → Cot

Secant: $\sec\theta = \frac{1}{\cos\theta} = \frac{\text{Hyp}}{\text{Adj}}$

Cosecant: $\csc\theta = \frac{1}{\sin\theta} = \frac{\text{Hyp}}{\text{Opp}}$

Cotangent: $\text{Cot}\theta = \frac{1}{\text{Tan}\theta} = \frac{\text{Adj}}{\text{Opp}}$

Given $\triangle ABC$ find each of the following as ratios:

$\text{Sin}A = \frac{35}{37}$

$\text{Cos}A = \frac{12}{37}$

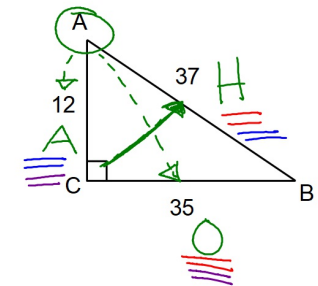
$\text{Tan}A = \frac{35}{12}$

$\text{Sec}A = \frac{37}{12}$

$\text{Csc}A = \frac{37}{35}$

$\text{Cot}A = \frac{12}{35}$

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Given $\triangle ABC$ find each of the following as ratios:

$\text{Csc}B = \frac{101}{20} \rightarrow \text{Sin}B = \frac{20}{101}$

$\text{Tan}A = \frac{99}{20}$

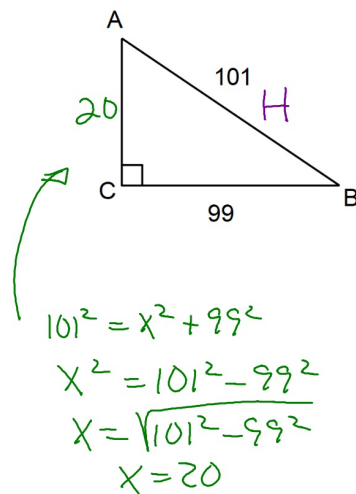
$\text{Sec}A = \frac{101}{20} \rightarrow \text{Cos}A = \frac{20}{101}$

$\text{Cot}B = \frac{99}{20} \rightarrow \text{Tan}B = \frac{20}{99}$

$\text{Sin}A = \frac{99}{101}$

$\text{Cos}B = \frac{99}{101}$

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Since there are no Sec, Csc, or Cot buttons on your calculator how would you find $\text{Csc}42^\circ$?

Use the definition of Csc: $\text{Csc}\theta = \frac{1}{\text{Sin}\theta}$

therefore: $\text{Csc}42^\circ = \frac{1}{\text{Sin}42^\circ} = 1.49$

Find the value of each to the nearest hundredth.

$$\text{Cot}58^\circ = \frac{1}{\text{Tan}58^\circ} = 0.62$$

$$\text{Sec}83^\circ = \frac{1}{\text{Cos}83^\circ} = 8.21$$

$$\text{Csc}4^\circ = \frac{1}{\text{Sin}4^\circ} = 14.34$$

You can now finish Practice #6 which is posted on my blog.

