

Geometry CC – Mr. Valentino
 Unit 7 Lesson 5: Trig to find Sides

Name: _____
 Date: _____ Period: _____

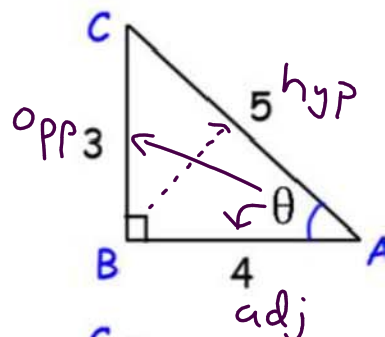
Aim: How can we set up trig ratios to find missing sides of right triangles?

RIGHT TRIANGLE TRIGONOMETRY

The reference angle here is A or θ (theta)

The sides have three names:

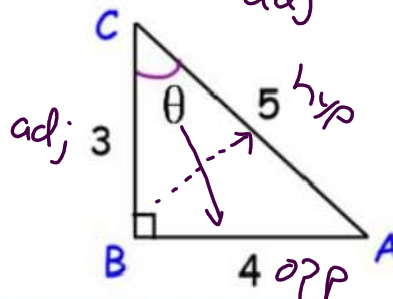
- hypotenuse: the longest side of the triangle
- adjacent: the leg next to the angle
- opposite: the leg across from the angle



What if...our reference angle was C, instead?

Rename the...

- hypotenuse: the longest side of the triangle
- adjacent: the leg next to the angle
- opposite: the leg across from the angle



**Note: Our angle will never be the right angle.

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Trigonometric ratios describe relationships between certain sides and angles of a right triangle.

$$\sin \theta = \frac{\text{opp}}{\text{hyp}}$$

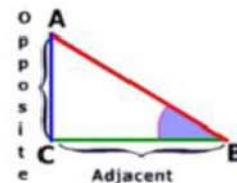
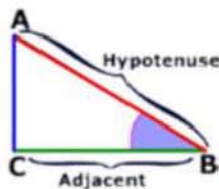
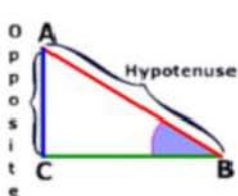
$$\cos \theta = \frac{\text{adj}}{\text{hyp}}$$

$$\tan \theta = \frac{\text{opp}}{\text{adj}}$$

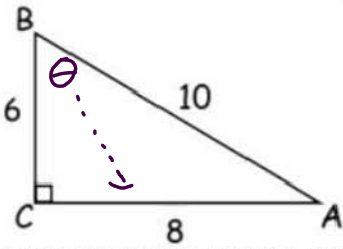
$$\sin(B) = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos(B) = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan(B) = \frac{\text{opposite}}{\text{adjacent}}$$



SOH CAH TOA



$$\sin(A) = \frac{6}{10}$$

$$\cos(A) = \frac{8}{10}$$

$$\tan(A) = \frac{6}{8}$$

$$\sin(B) = \frac{8}{10}$$

$$\cos(B) = \frac{6}{10}$$

$$\tan(B) = \frac{8}{6}$$

Can the ratio for sine or cosine ever be greater than 1?

No!

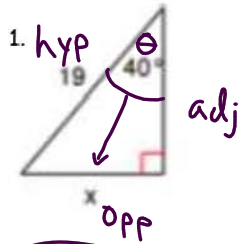
Can the ratio for tangent ever be greater than 1?

Yes.

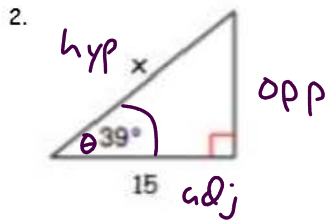
We can use trig ratios to find the lengths of missing sides!

Find the length of the missing side. Round your answer to the nearest tenth.

SOH CAH TOA



~~$\sin 40 = \frac{x}{19}$~~
 $x = 19 \sin 40$
 $x = 12.2$



~~$\cos 39 = \frac{15}{x}$~~
 $\frac{15}{\cos 39} = \frac{x \cos 39}{\cos 39}$

