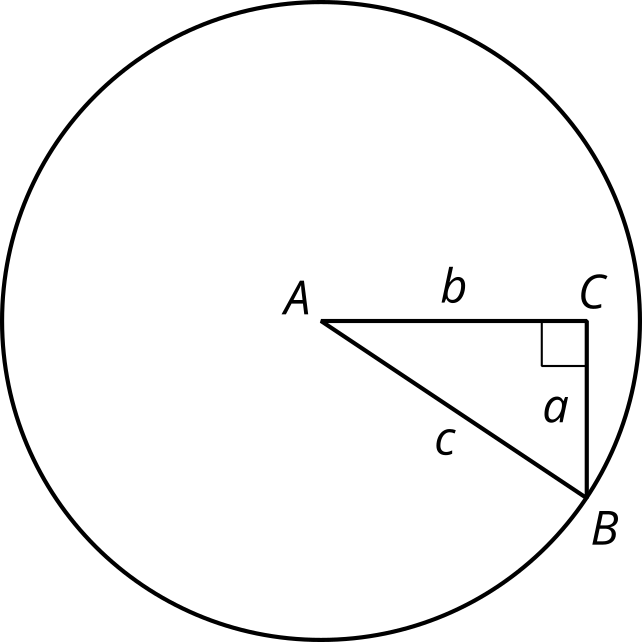
## Lesson 2: Revisiting Right Triangles

* Let’s recall and use some things we know about right triangles.

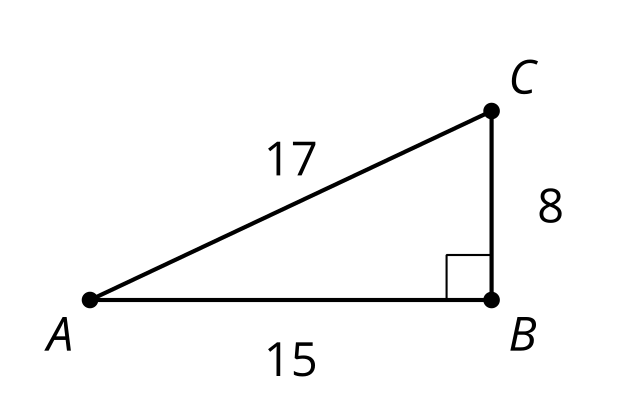
### 2.1: Notice and Wonder: A Right Triangle

What do you notice? What do you wonder?

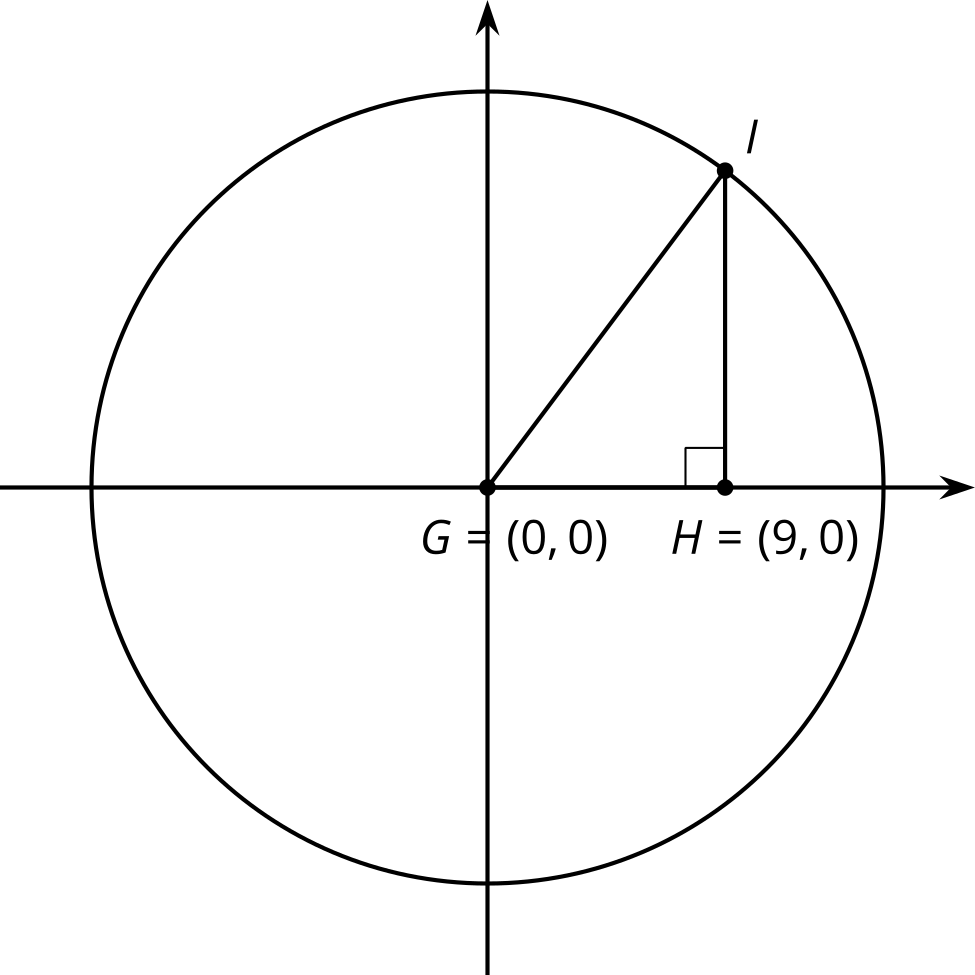


### 2.2: Recalling Right Triangle Trigonometry

1. Find , , and for triangle .

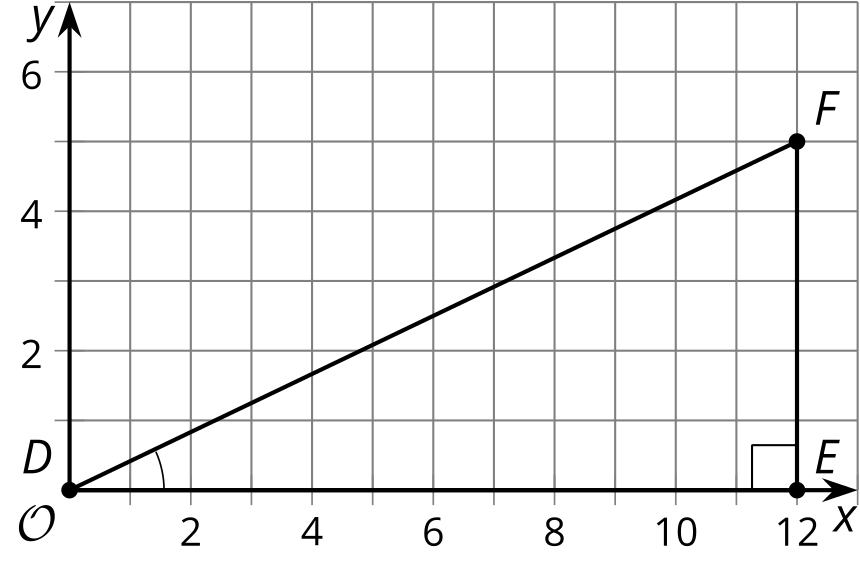
* 

1. Sketch a triangle where and is a right angle. What is the value of for this triangle? Explain how you know.
2. If the coordinates of point are , what is the value of , , and for triangle ? Explain or show your reasoning.

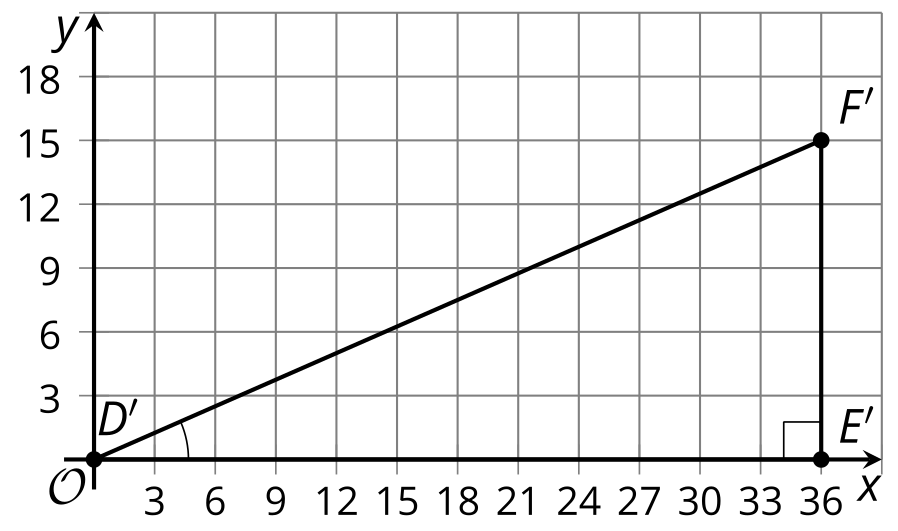
* 

### 2.3: Shrinking Triangles

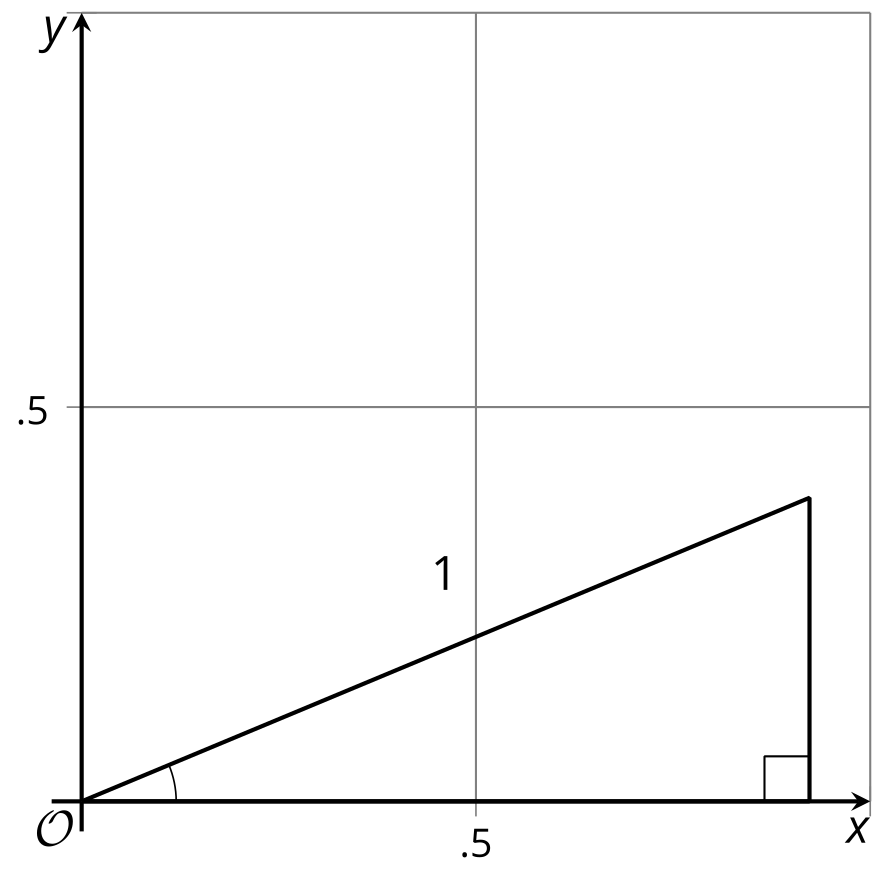
1. What are , , and ? Explain how you know.

* 

1. Here is a triangle similar to triangle .

* 
  1. What is the scale factor from to ? Explain how you know.
  2. What are , , and ?

1. Here is another triangle similar to triangle .

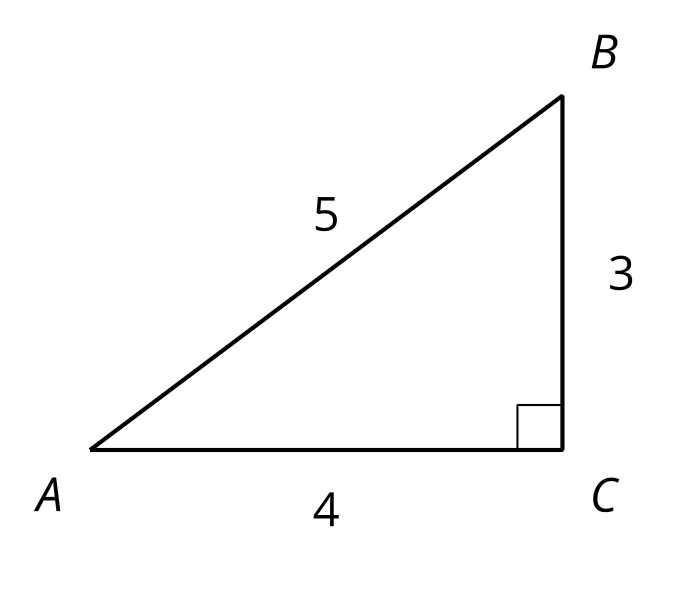
* 
  1. Label the triangle .
  2. What is the scale factor from triangle to triangle ?
  3. What are the coordinates of ? Explain how you know.
  4. What are , , and ?

#### Are you ready for more?

Angles and in triangles  and are right angles. If , is that sufficient to show that  is similar to ? Explain your reasoning.

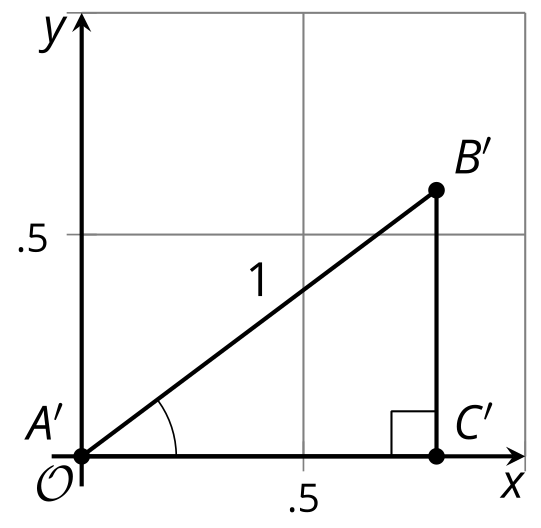
### Lesson 2 Summary

In an earlier course, we studied ratios of side lengths in right triangles.



In this triangle, the cosine of angle is the ratio of the length of the side adjacent to angle to the length of the hypotenuse—that is . The sine of angle is the ratio of the length of the side opposite angle to the length of the hypotenuse—that is . The tangent of angle is the ratio of the length of the side opposite angle to the length of the side adjacent to angle —that is .

Now consider triangle , which is similar to triangle with a hypotenuse of length 1 unit. Here is a picture of triangle on a coordinate grid:



Since the two triangles are similar, angle and are congruent. So how do the values of cosine, sine, and tangent of these angles compare to the angles in triangle ? It turns out that since all three values are ratios of side lengths, , , and .

Notice that the coordinates of are because segment has length and segment has length . In other words, the coordinates of are .



© CC BY 2019 by Illustrative Mathematics®