Lesson 2.3.5: Applications of Similar Triangles

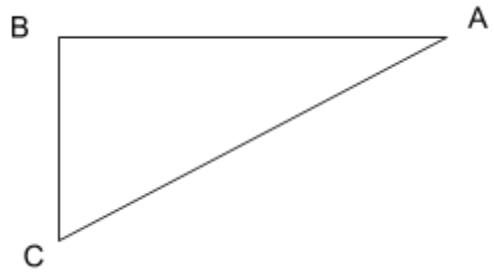
Targets:

1. I can use the rules of similar triangles to find missing heights and lengths.

Warm Up

Follow these steps:

1. Dilate triangle ABC with a scale factor of 2 and the center of dilation is B.
2. Using a ruler, find the lengths of your original 3 sides and your new 3 sides. Are the sides proportional?

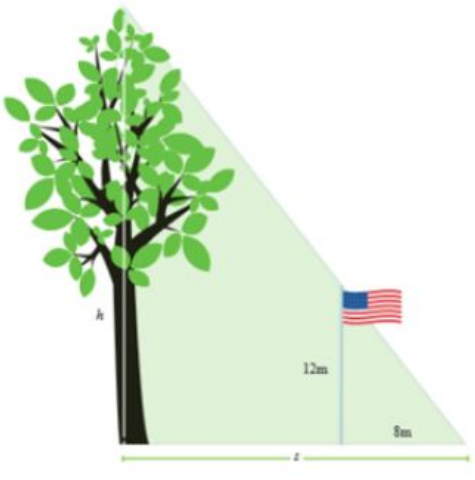


Why shadows make similar triangles

Watch this video as a quick introduction to this lesson. We will be talking about shadows throughout this lesson and we need to understand why shadows make similar triangles.
Copy the notes here:

Practice 1

At a certain time of day, a 12 meter flagpole casts an 8 m shadow. Write an equation that would allow you to find the height, h, of the tree that uses the length, s, of the tree's shadow.



Practice 2

In the diagram below a large flagpole stands outside of an office building. marquis realizes that when he looks up from the ground, 60 m away from the flagpole, that the top of the flagpole and the top of the building line up. If the flagpole is 35 m tall, and Marquis is 170 m from the building, how tall is the building?

a. Are the triangles in the diagram similar? Explain.

b. Determine the height of the building using what you know about scale factors.

c. Determine the height of the building using ratios between similar figures.

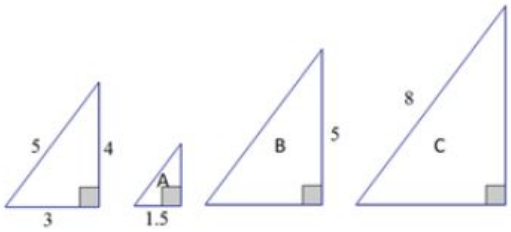
d. Determine the height of the building using ratios within similar figures.

Practice 3

The following right triangles are similar. We will determine the unknown side lengths by using ratios within the first triangle. For each of the triangles below, we define the base as the horizontal length of the triangle and the height as the vertical length.

a. Find the value of the hypotenuse for triangles A and B.

b. Find the value of the horizontal length for triangles B and C.



c. Find the value of the vertical length for triangles A and C.

Exit Ticket

Dennis needs to fix a leaky roof on his house but does not own a ladder. He thinks that a 25-foot ladder will be long enough to reach the roof, but he needs to be sure before he spends the money to buy one. He chooses a point *P* on the ground where he can visually align the roof of his car with the edge of the house roof. Help Dennis determine if a 25-foot ladder will be long enough for him to safely reach his roof.