

**Topic:
Similar
Figures**

Lesson Essential Question:

What information do you need know to find the dimensions of a figure that is similar to another?

Key Vocabulary

Congruent

having the same size and shape; equal

- **Congruent sides (or angles)**

Corresponding

matching sides (or angles) of two or more polygons

- **Corresponding sides (or angles)**

Similar Figures

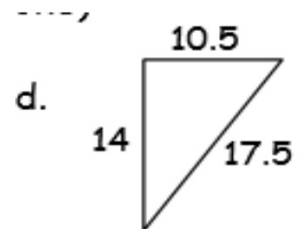
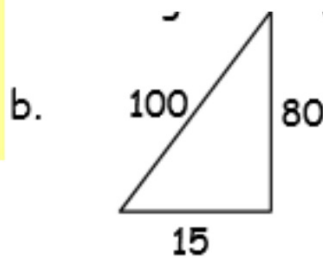
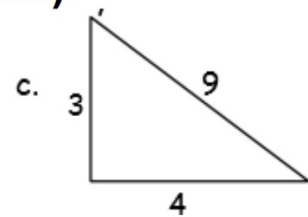
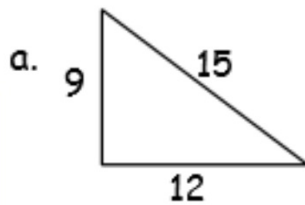
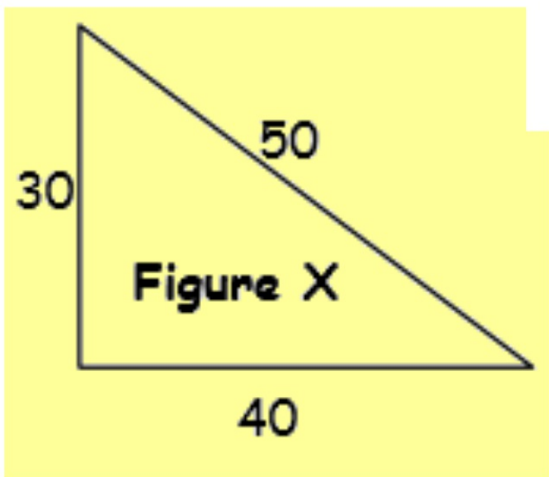
must have congruent corresponding angles and proportional corresponding sides; same shape different size

'~' symbol to describe similarity

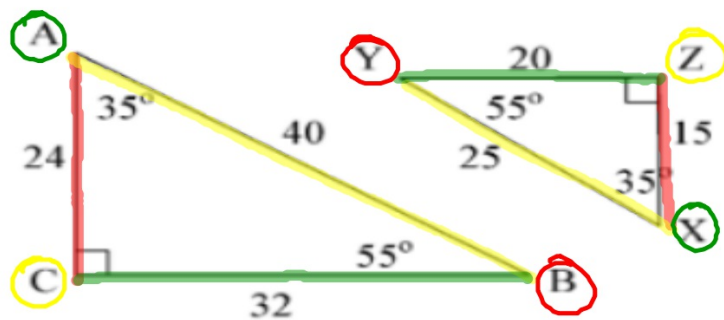
'≅' symbol to describe congruence

Sim Fig or NO Sim Fig??

**Which of the following figures are similar to Figure X?
(there may be more than one)**



Are these figures similar?



Corresponding Sides??

$$\overline{AC} \sim \overline{XZ}$$

$$\overline{BC} \sim \overline{YZ}$$

$$\overline{AB} \sim \overline{XY}$$

Corresponding Angles??

$$\angle B \sim \angle Y$$

$$\angle X \sim \angle A$$

$$\angle C \sim \angle Z$$

Are they

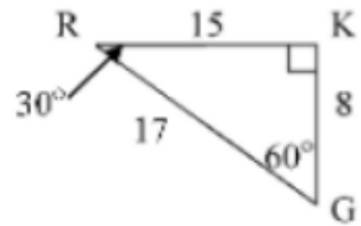
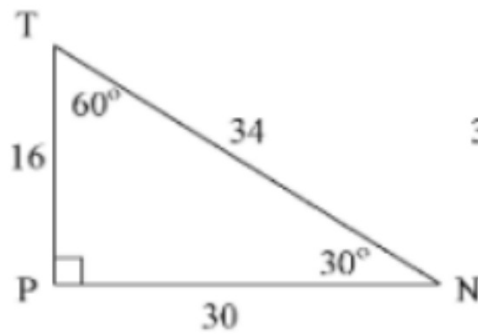
Proportional??

$$\frac{AC}{BC} = \frac{XZ}{YZ}$$

$$\frac{AB}{AC} = \frac{XY}{XZ}$$

$$\frac{BC}{AB} = \frac{YZ}{XY}$$

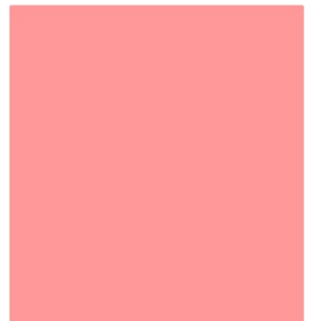
Are these figures similar?



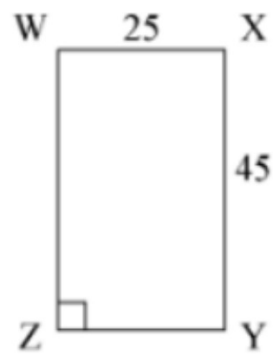
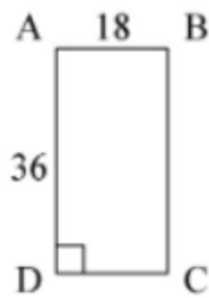
Corresponding Sides??

Corresponding Angles??

Are they Proportional??



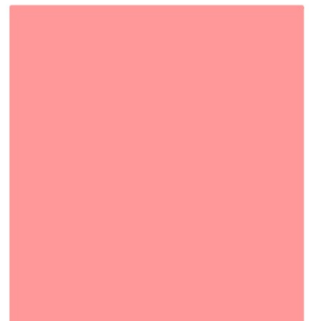
Are these figures similar?



Corresponding Sides??

Corresponding Angles??

Are they Proportional??



Warm up:

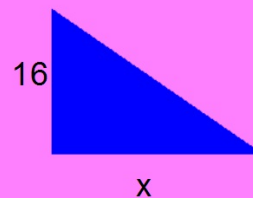
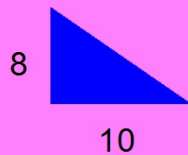
Take out:

- **Notebook**
- **pencil**
- **3 colors (markers/colored pencils)**

Similar and Congruent Figures Worksheet

- **Color Code the Corresponding Sides**

Finding the missing side.

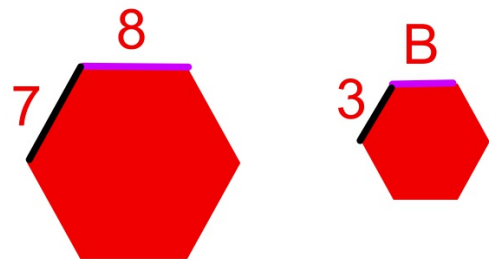
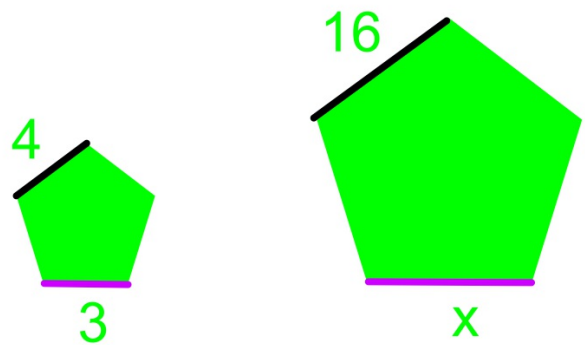


We can use proportions to solve for the missing side in similar figures.

$$\frac{8}{10} = \frac{16}{x}$$

Solve for x.

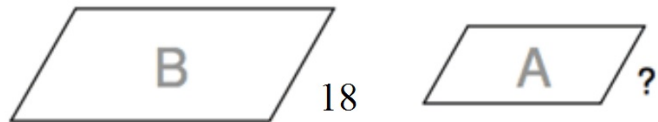
Step 1) Color your sides different colors.
Step 2) Create a proportion for the color coded corresponding sides.
Step 3) Cross multiply and divide



Step 1) Color your sides different colors.

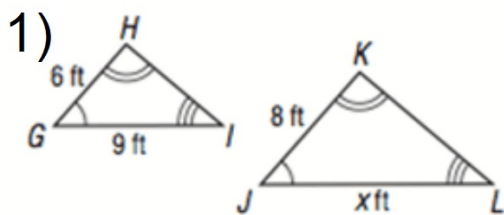
Step 2) Create a proportion for the color coded corresponding sides.

Step 3) Cross multiply and divide

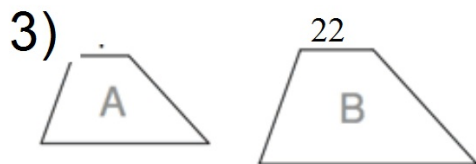
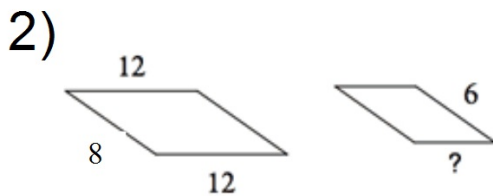


the ratio from A to B = 2:3

Try some on your own...

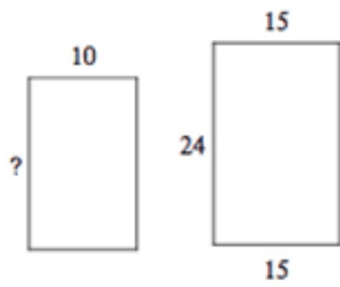


Step 1) Color your sides different color
Step 2) Create proportion for the color code corresponding sides.
Step 3) Cross multiply and divide



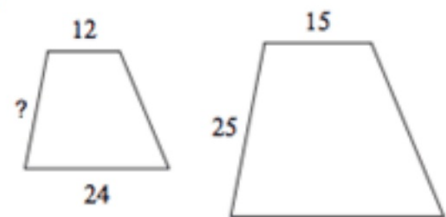
the ratio from A to B = 1:2

1)



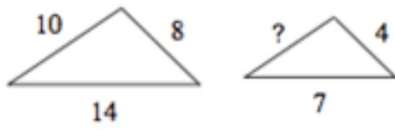
$$\frac{10}{x} = \frac{15}{24}$$

2)

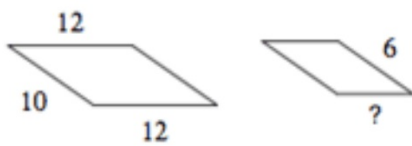


Step 1) Color your sides different colors.
Step 2) Create a proportion. Color the corresponding sides.
Step 3) Cross multiply and divide.

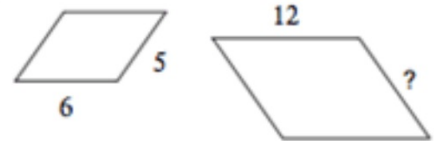
3)



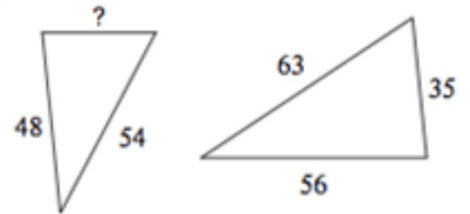
5)



4)



6)



Step 1) Color your sides different colors.
Step 2) Create a proportion using the color of the corresponding sides.
Step 3) Cross multiply and divide.

**Topic:
Indirect
Measurements**

Lesson Essential Question:

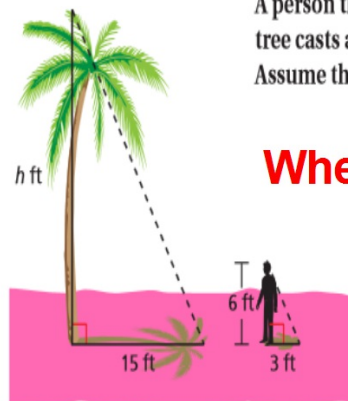
How can we use similar figures to find and describe indirect measures?

What is an "indirect" measurement?

the use of similar figures to find a missing measure that is difficult to find directly

Example

A person that is 6 feet tall casts a 3-foot-long shadow. A nearby palm tree casts a 15-foot-long shadow. What is the height h of the palm tree? Assume the triangles are similar.

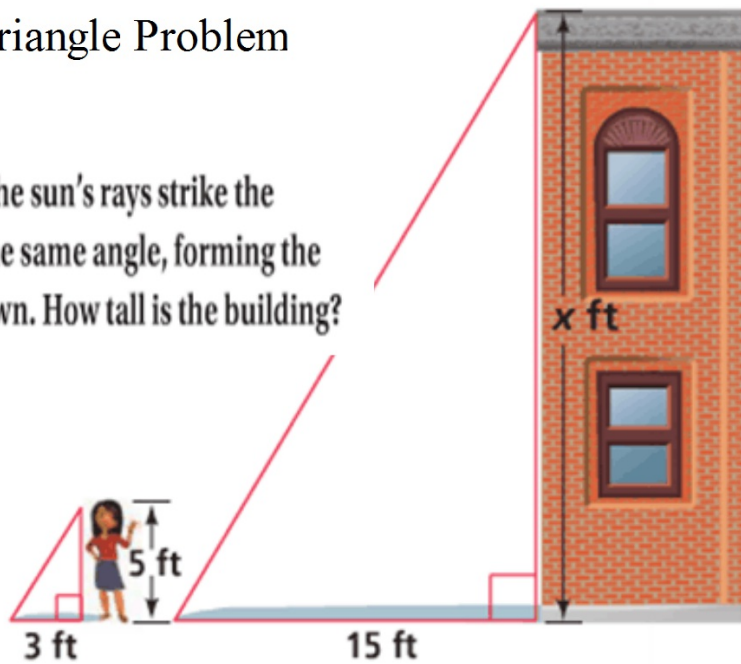


Where's your proportion??

PAGE 27

Similar Triangle Problem

Indirect Measurement The sun's rays strike the building and the girl at the same angle, forming the two similar triangles shown. How tall is the building?



Step 1) Color your sides different colors.
Step 2) Create a proportion for the color coded corresponding sides.
Step 3) Cross multiply and divide

**Some
Examples**

A giraffe is 18 feet tall and cast a shadow of 12 feet. Corey cast a shadow of 4 feet. How tall is Corey's shadow?

1. Draw your figure
2. Set up a proportion

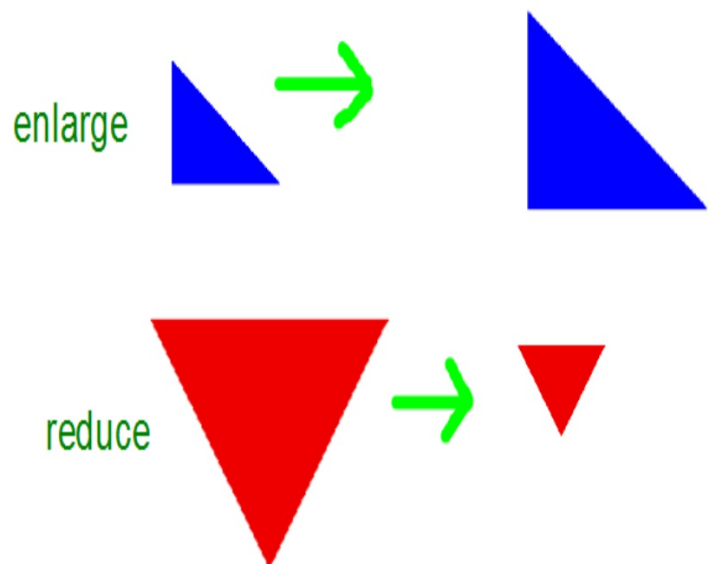
A flagpole cast a shadow of 28 feet long. A person standing by cast a shadow of 8 feet long. If the person is 6 feet tall, how tall is the flagpole?

1. Draw your figure
2. Set up a proportion

LEQ: How do we use scale factor to enlarge or reduce an object? What does it mean to draw an object to scale?

Reducing or enlarging a figure proportionally is called a **dilation**.

The **scale factor** tells how many times larger or smaller a similar figure is than its original.



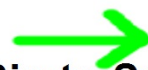
enlarge



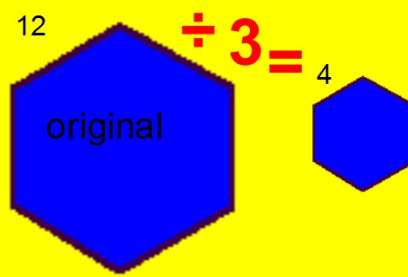
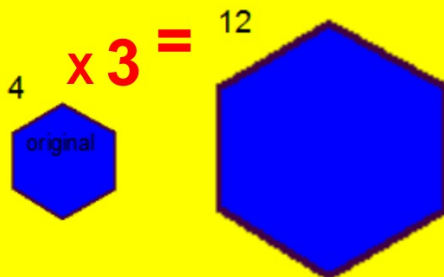
Small to Big
Multiply



reduce



Big to Small
Divide



The scale factor for these figures would be 3.



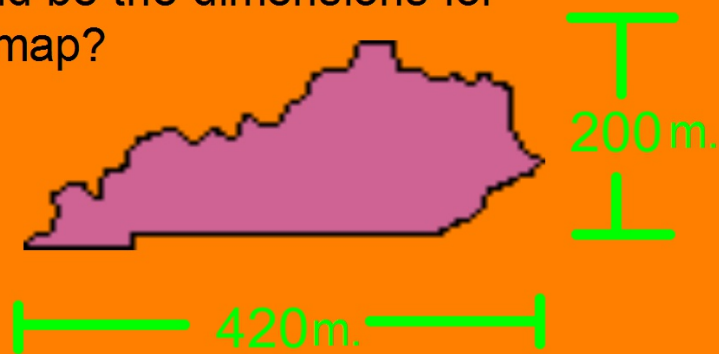
So we if make a formula for
scale factor,

$$\begin{array}{c} 2 \\ \square \end{array} \times ? = \begin{array}{c} 8 \\ \square \end{array}$$

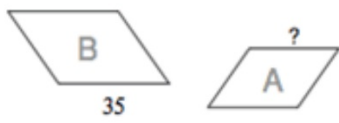
it would be...

original x scale factor = dilation

The state of Kentucky is 420 miles by 200 miles. If the map scale factor is 1 in = 100 miles. What would be the dimensions for the map?



13)



scale factor from A to B = 6 : 7



14)



scale factor from A to B = 1 : 3



9)



scale factor from A to B = 5 : 6



11)



scale factor from A to B = 2 : 3



10)



scale factor from A to B = 1 : 7

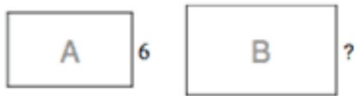
12)



scale factor from A to B = 1 : 2



7)



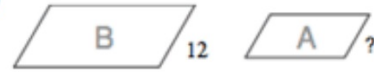
scale factor from A to B = 2 : 7



A is 2 = 6

B 7 x

8)



scale factor from A to B = 2 : 3



