Similar Figures

6.1B

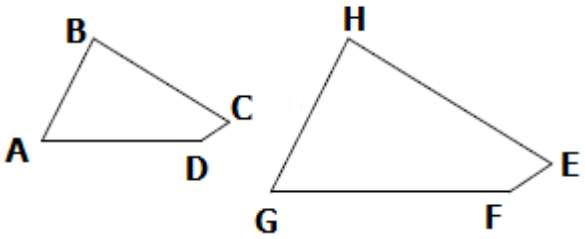
Vocabulary

Symbol	Definition	Example
$\sim$		
ΔABC		
$\overline{DE}$		
$\angle HIJ$		
$\cong$		

Things to remember when figures are similar:

1) ONLY the angles are congruent
2) Side lengths are proportional

Circle all the true statements regarding the similar figures represented below.



$ABCD \sim GHEF$

$FEHG \sim ABCD$

$\angle A \cong \angle G$

$BCDA \sim HEFG$

$\frac{AB}{GH} = \frac{CD}{EF}$

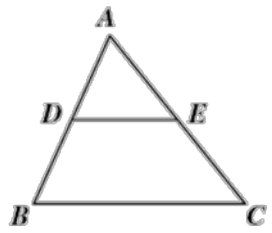
$\frac{BA}{HG} = \frac{FE}{DC}$

Similar Figures

Steps to determine if two figures are similar:

1) Take the first set of corresponding sides and write them as the first fraction of the proportion
2) Take the other set of corresponding sides and write them as the second fraction of the proportion.
3) Cross multiply
4) If it forms a true proportion (the fractions are equivalent) then the figures are similar.

1. If ΔABC is similar to ΔADE, then $\frac{AB}{AD} \cong \frac{?}{AE}$. Which segment replaces the "?" to make the statement true?



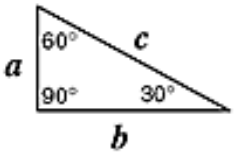
2. This is a pair of similar triangles. Which of the following proportions is true for these triangles?

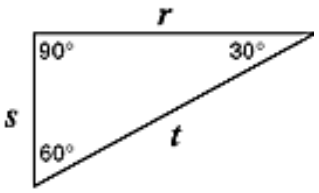
a. $\frac{a}{s} = \frac{c}{t}$

b. $\frac{a}{s} = \frac{b}{t}$

c. $\frac{a}{a} = \frac{c}{r}$

d. $\frac{a}{s} = \frac{s}{b}$





Steps to find a missing measurement:

1) Determine the corresponding sides
2) Set up a proportion
3) Cross multiply to solve for the missing length
4) Label your answer and check your work

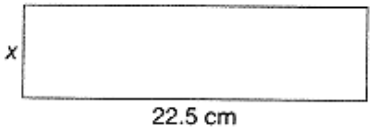
1. Two rectangles are similar. Which proportion could you solve to find the missing side length?

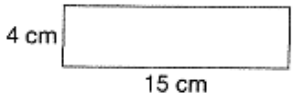
a. $\frac{4}{15} = \frac{22.5}{x}$

b. $\frac{4}{x} = \frac{22.5}{15}$

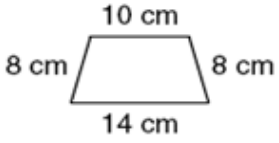
c. $\frac{x}{15} = \frac{22.5}{4}$

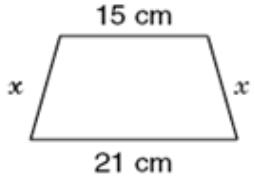
d. $\frac{4}{15} = \frac{x}{22.5}$





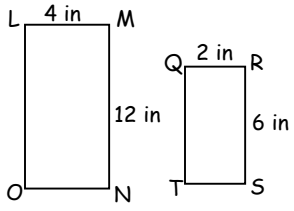
2. What must the value of *x* be in order for the figures below to be similar?

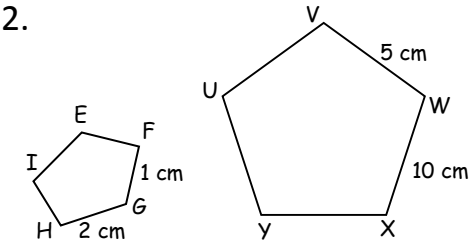


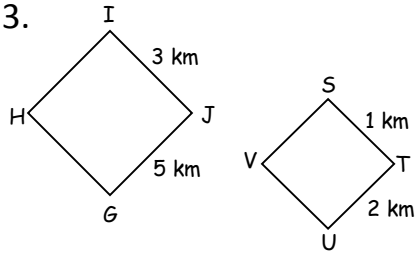


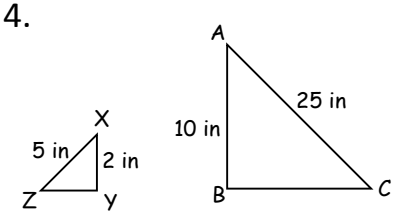
Similar Figures Practice

Determine if the two figures are similar.

1. 

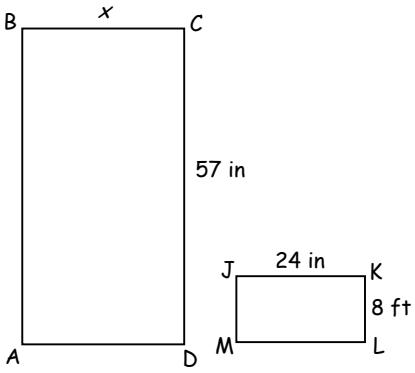
2. 

3. 

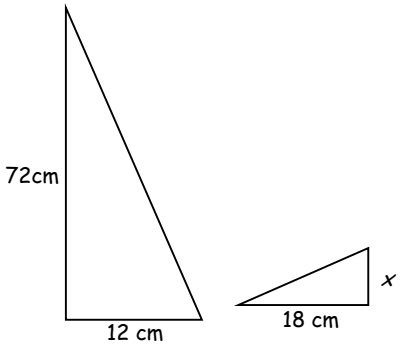
4. 

Find the missing measurement.

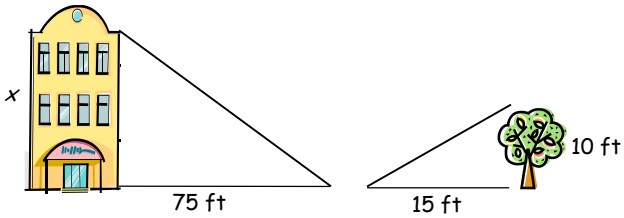
5. What must the value of *x* be in order for the figures below to be similar?



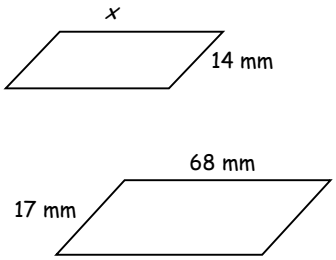
6. What must the value of *x* be in order for the figures below to be similar?



7. What must the value of *x* be in order for the figures below to be similar?

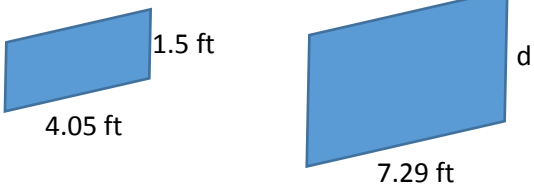


8. What must the value of *x* be in order for the figures below to be similar?

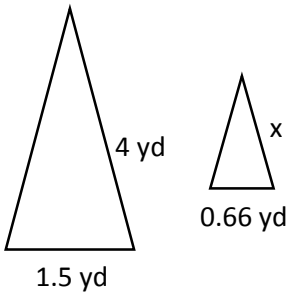


9. Hakan is standing next to a building whose shadow is 15 feet long. If Hakan is 6 feet tall and is casting a shadow 2.5 feet long, how high is the building?

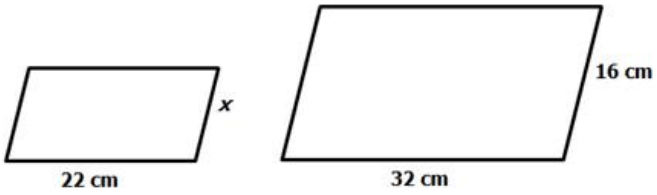
10. Find the value of *d* in the similar polygons below.



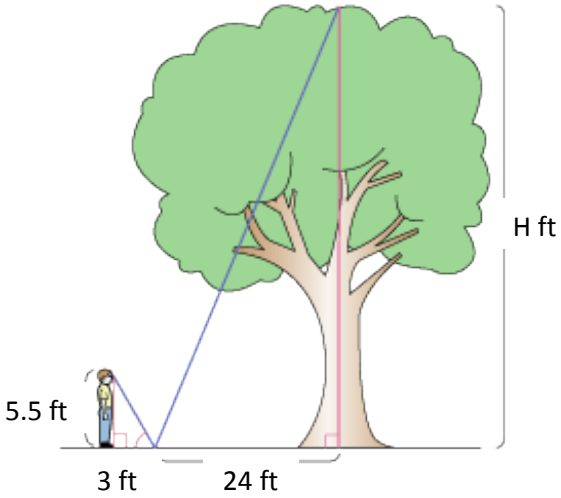
11. Find the value of *x* in the polygons below.



12. What must the value of *x* be in order for the figures below to be similar?



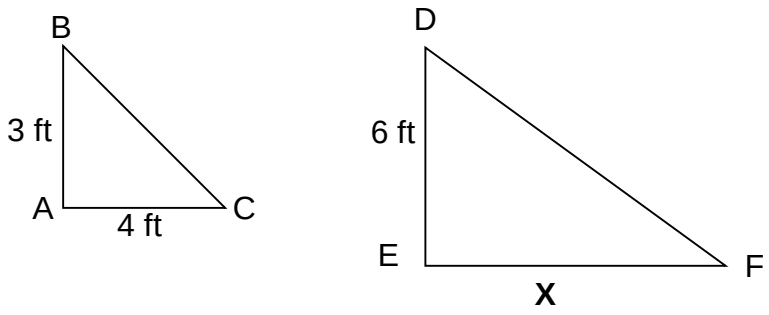
13. Use the similar triangles below to find the height of the tree.



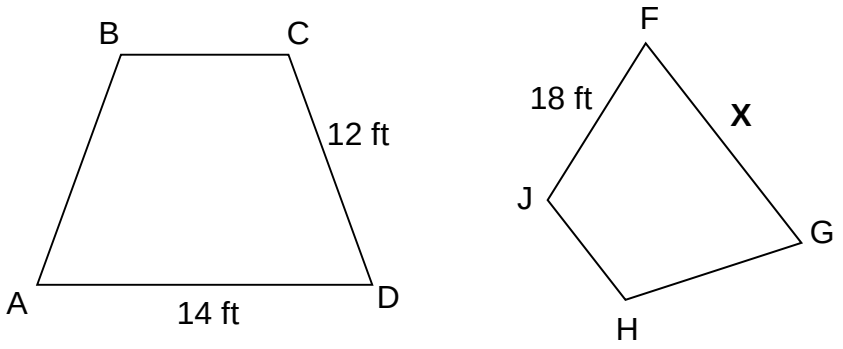
14. The tallest tree in the United States is a Coast Redwood in Jedidiah Smith State Park in California. It is 321 feet tall. Suppose you are 5 feet 8 inches tall and cast a shadow that is 2 feet at a certain time of day. About how long is the tree's shadow at the same time of day? (convert 5 ft 8 inches to feet)

Similar Figures Homework

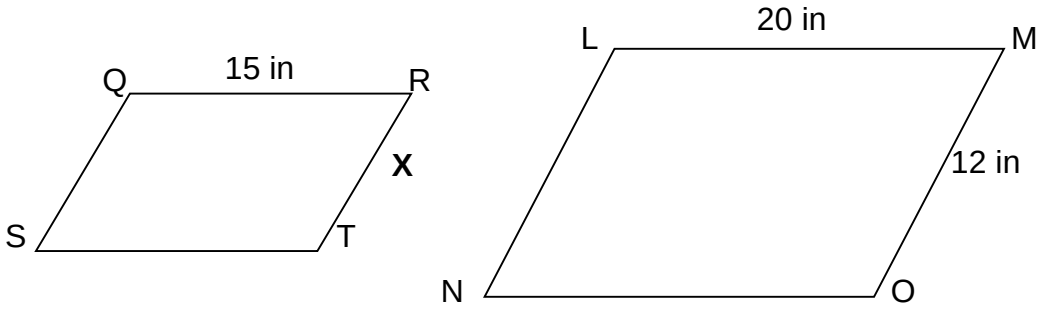
Find the value of x in each pair of similar figures.

1) 

1) _____

2) 

2) _____

3) 

3) _____

Read and solve each problem carefully. Draw pictures to help you!

4) The length and width of a rectangular box are 10 in. and 8 in., respectively. Another rectangular box has a length of 15 in. and a width of 12 in. respectively. Are the length and width dimensions of the two rectangular boxes similar?

5) The sides of two triangles are in the ratio of 1:2. If the length of the sides of the first triangle are 5 cm, 9 cm, and 11 cm, what are the lengths of the sides of the second triangle?

6) A tree casts a shadow 60 feet long. At the same time, a nearby 8-foot post casts a 12-foot shadow. How tall is the tree?

7) A grain silo casts a shadow of 40 feet while a nearby fence post casts a shadow of 2 feet. The fence post is 5 feet high. How tall is the grain silo?

8) If Quadrilateral DOGS is similar to Quadrilateral BEAR, then ___

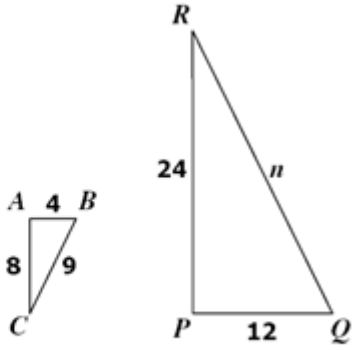
A $\frac{GS}{DO} = \frac{AR}{BE}$

B $\frac{DO}{SD} = \frac{BE}{AR}$

C $\frac{OG}{DS} = \frac{AR}{BR}$

D $\frac{SD}{AR} = \frac{OG}{EA}$

9) Triangle ABC is similar to triangle PQR. Which proportion can be used to find n?



A $\frac{8}{9} = \frac{n}{12}$

B $\frac{8}{12} = \frac{n}{9}$

C $\frac{4}{8} = \frac{12}{n}$

D $\frac{4}{9} = \frac{12}{n}$