Lesson 4.2 Using Similar shapes

Day 1
Teach objective and review unit "Reading strategies" and "Success for English learners"
Assignment - Guided practice and Independent practice completed as a class

Reading strategies answers
1. Because you are not actually measuring, but using proportions to find a missing measure
2. Substituting the lengths of the sides into the proportion
3. 18/6 = y/5

Success for English learners
1. Yes; because the triangles are similar, the sides are proportional.
2. Bigger; the length of the pool is greater than the length of the volleyball court. So if the 2 rectangles are similar, the width of the pool must also be greater than the width of the volleyball court.

Day 2
Review
Cooperative (elbow buddy)assignment 4.2 practice and problem solving: D
4.2 Practice and problem solving: A/B

Login to Go Math
Go to the Resources Tab
Click on the Student Online Edition (yellow open book)
This will take you to another window to an interactive student edition textbook.

Go to page 121

Answers to "reflect", Explore activity" and "your turn" questions

EA. 3, 2, 3, 2, 3, 3, 3, 3, 5, 25
1. AC over JL, because all sides are proportional
2. 59 degrees; 3cm
3. 120 degrees; 150cm
4. 36/54 = x/42; 28 ft
5. 4/6 = x/12; 8ft
6. 1.5/6 = 4.5/x; 18ft

For answers to the guided practice and independent practice, see Coach Gammon.

Additional web sites
     https://www.youtube.com/watch?v=1UuiF3mskQA

Remember, on the online edition, you can click on the "math on the spot" for a little extra teaching from Prof Burger. If you only have your book, use a QR scanner on the "math on the spot"

Lesson 4-2

Using similar shapes to find Unknown Measurements

How can you use similar shapes to find unknown measures?

To find an unknown length: _____ a _____
using corresponding sides.

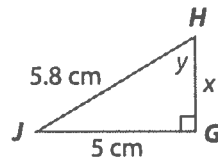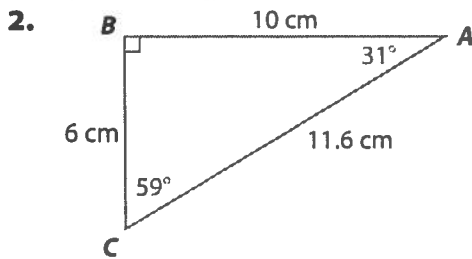To find an unknown angle: _____ it to the _____ angle on the _____ shape

What do the following symbol represent?

△ABC — _____

AB — _____

Vocab

_____ The process of using similar shapes and proportions to find a measure.

2.

B ———10 cm——— A
                    31°
6 cm   11.6 cm
    59°
C

H
5.8 cm y x
J   5 cm   G

y = _____   x = _____

3.

        C
160 cm / 120 cm
   B s A
   60 cm

H 19°
   t   41°
120° J 90 cm G
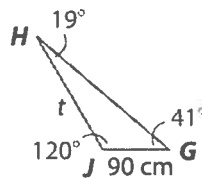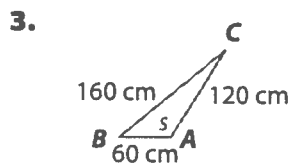
s = _____   t = _____

Lesson 4-2

Using similar shapes to find Unknown Measurements

How can you use similar shapes to find unknown measures?

To find an unknown length: _Write_ a _Proportion_ using corresponding sides.

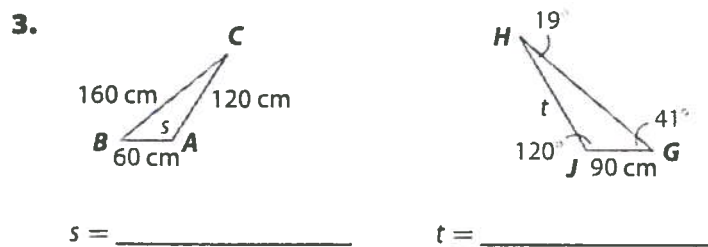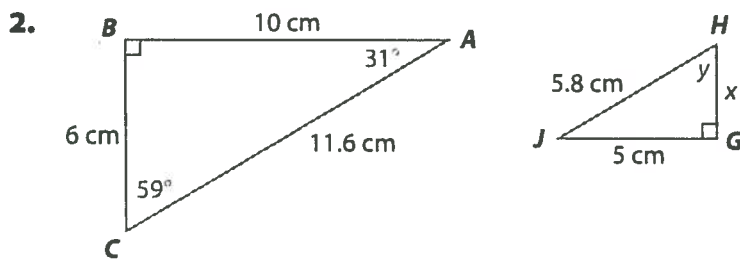To find an unknown angle: _compare_ it to the _corresponding_ angle on the _similar_ shape

What do the following symbol represent?

$\triangle ABC$ — _triangle_ _ABC_

AB — _side_ _AB_

Vocab
_indirect_ _measurement_ The process of using similar shapes and proportions to find a measure.

2.

$y =$ _____ $x =$ _____

3.

$s =$ _____ $t =$ _____

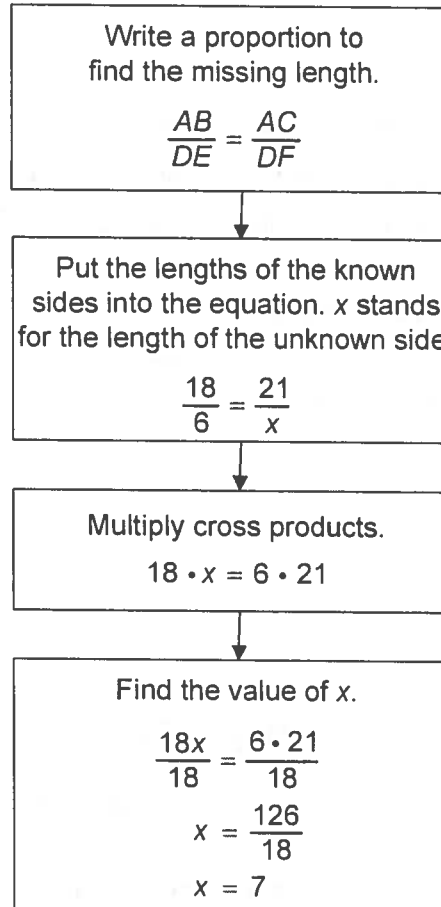| LESSON	**Using Similar Shapes**
4-2	

Reading Strategies: Use a Flowchart

It is very difficult to measure the height of tall tree or a utility pole directly. You can set up proportions to measure very tall objects indirectly.

This method of measuring is called **indirect measurement**. You do not actually measure the height. You use a proportion to find the height.

These two triangles are similar.
Find length *x* in triangle *DEF*.
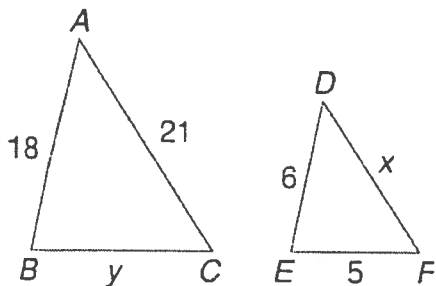
The flowchart helps you set up a proportion to find the value of *x*.

Write a proportion to find the missing length.

$$\frac{AB}{DE} = \frac{AC}{DF}$$

↓

Put the lengths of the known sides into the equation. *x* stands for the length of the unknown side.

$$\frac{18}{6} = \frac{21}{x}$$

↓

Multiply cross products.

$$18 \cdot x = 6 \cdot 21$$

↓

Find the value of *x*.

$$\frac{18x}{18} = \frac{6 \cdot 21}{18}$$

$$x = \frac{126}{18}$$

$$x = 7$$

Answer each question.

1. Why is this method called indirect measurement?

   _____

   _____

2. What is the next step after setting up the proportion?

   _____

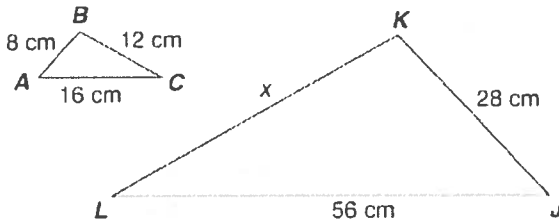3. Write a proportion to find the length *y* in triangle *ABC*.

   _____

LESSON
4-2
Using Similar Shapes
Success for English Learners

Problem 1

Identify the corresponding sides: $\triangle ABC \sim \triangle JKL$

$\overline{AC}$ corresponds to $\overline{JL}$.
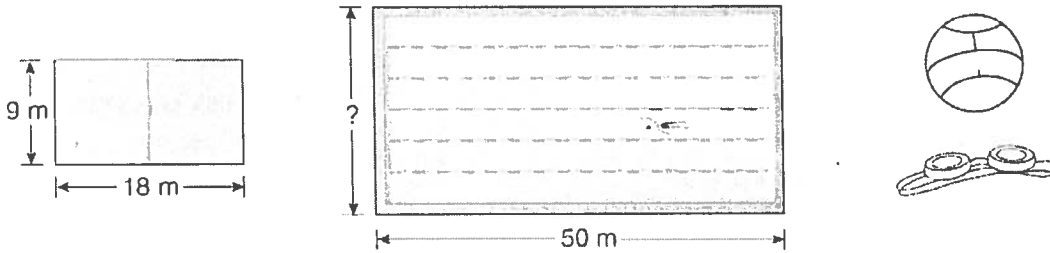
$\overline{BC}$ corresponds to $\overline{KL}$.

$\overline{AB}$ corresponds to $\overline{JK}$.

To find x, you only need to use 2 of the 3 corresponding sides:

1. the side in question: $\overline{BC}$ and $\overline{KL}$.

2. 1 of the other 2 sides, either $\overline{AC}$ and $\overline{JL}$ or $\overline{AB}$ and $\overline{JK}$.

Problem 2

Write a proportion comparing the lengths and widths of the volleyball court and the pool.

$$\frac{\text{Length of Volleyball Court}}{\text{Length of Pool}} = \frac{\text{Width of Volleyball Court}}{\text{Width of Pool}}$$

$$\frac{18}{50} = \frac{9}{w}$$

1. If you use the sides AC and JL instead of AB and JK in Problem 1, would you get the same answer for x? Explain your answer.

_____

_____

2. In Problem 2, do you expect the width of the swimming pool to be bigger or smaller than the width of the volleyball court? Why?
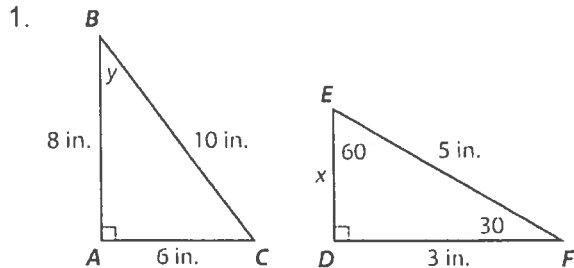
_____

_____

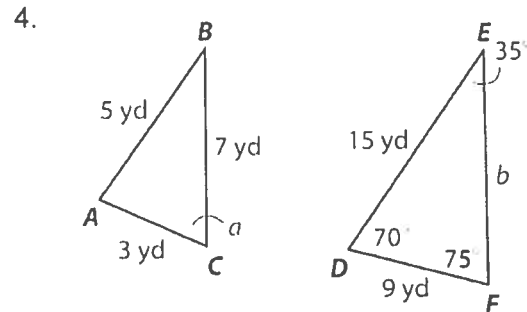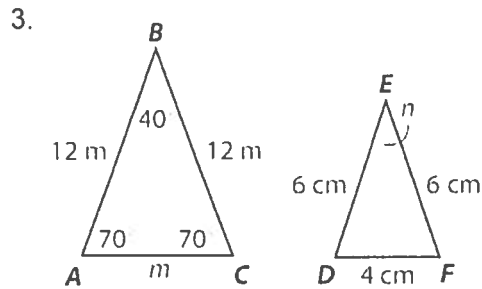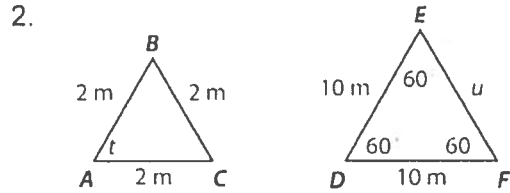| LESSON	**Using Similar Shapes**
4-2	*Practice and Problem Solving: D*

The triangles in each pair are similar. Find the unknown measures.
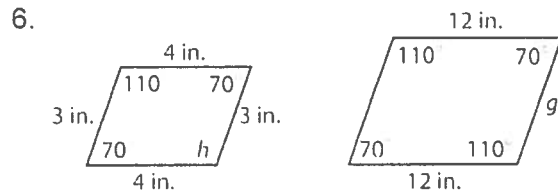**The first one is done for you.**

1.   *B*

   x = 4 in.; *y* = 60°

2.

3.

4.

The figures in each pair are similar. Find the unknown measures.
The first one is done for you.

5.

   c = 10 m; *d* = 90°

6.
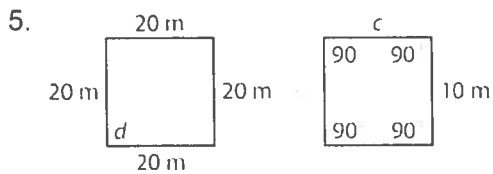
LESSON 4-2

Using Similar Shapes
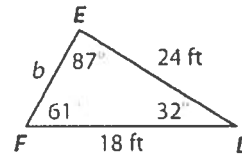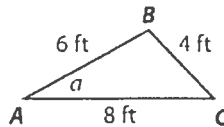
Practice and Problem Solving: A/B

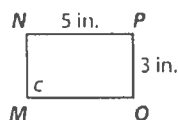**The triangles in each pair are similar. Find the unknown measures.**

1.
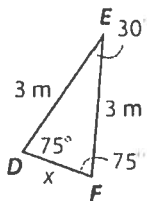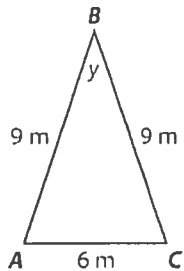
2.

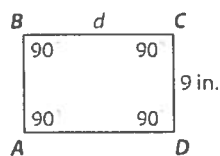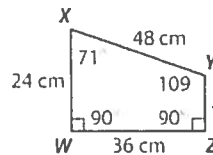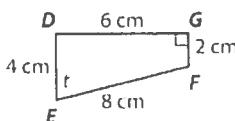_____   _____

The figures in each pair are similar. Find the unknown measures.

3.

4.

_____   _____

Solve.

5. Lydia wants to find the height of a flagpole. She measures the height of a tree and the length of the shadow it casts. The tree is 4 feet tall, and its shadow is 8.8 feet long. Next, Lydia measures the shadow cast by the flagpole, and finds it is 22 feet long. What is the height of the flagpole?

_____

6. Michael wants to find the length of the shadow of a tree. He measures the height of a fencepost and the length of the shadow it casts. The fencepost is 3.5 feet tall, and its shadow is 10.5 feet long. Next, Michael measures the height of the tree, and finds it is 6 feet tall. How long is the shadow of the tree?

_____