Lesson 4.1 Similar shapes and proportions

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. 24 – 24; yes
2. 20 – 25; no
3. 72 – 72; yes
4. 30 – 36; no
5. Cross-multiply the 2 ratios, if equal then the ratios are proportional

Success for English learners
1. Corresponding sides are proportional and corresponding angles are equal.
2. Write ratios of corresponding side length and check that the ratios are equal.

Day 2
Review
Cooperative (elbow buddy)assignment 4.1 practice and problem solving: D
4.1 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 115

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

EA. 3, 2, 3, 2, 3, 3, 3, 3, 5, 25
1. Changing only 1 dimension changes the shape of the figure. Both dimensions must change for the figure to have the same shape.
2. No, corresponding angles are not the same.
3. Yes, corresponding angles are the same and the corresponding sides are proportional. 1:4
4. Yes, all the angles are right angles and the ratio of the corresponding sides are proportional 1:3
5. No, although the angles are the same and the parallel sides are proportional, the non-parallel sides are not proportional.

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

Additional web sites

https://www.youtube.com/watch?v=LZ52UKfu1mo
https://www.youtube.com/watch?v=1O-ieOZ5y6s

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 4:1

Using Ratios to determine similar Figures

How can you use ratios to determine if 2 figures are similar?

1. Measures of _____ interior _____ are equal

and

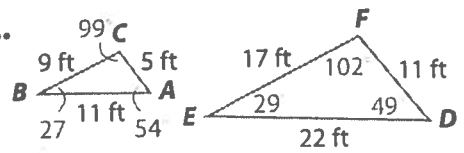
2. The _____ of the _____ of corresponding sides are proportional.

_____ Figures with the same shape but not necessarily the same size

_____ _____ Matching sides of 2 or more polygons.

_____ _____ angles in the same relative position with the same value.

2.



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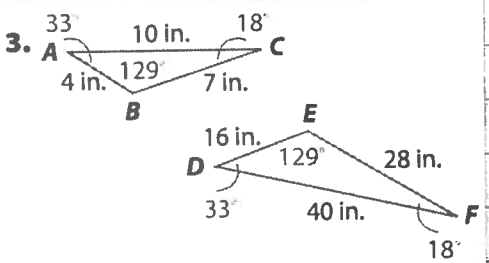

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Lesson 4:1

Using Ratios to determine similar Figures

How can you use ratios to determine if 2 figures are similar?

1. Measures of corresponding interior angles are equal

and

2. The ratio of the length of corresponding sides are proportional.

Similar Shapes — Figures with the same shape but not necessarily the same size

Corresponding sides — Matching sides of 2 or more polygons.

Corresponding angles — angles in the same relative position with the same value.

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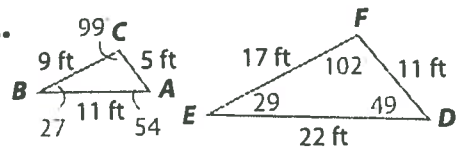

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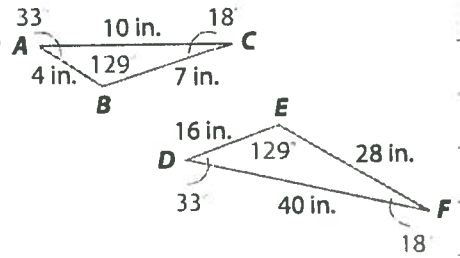


Name _____ Date _____ Class _____

LESSON 4-1

Similar Shapes and Proportions

Reading Strategies: Draw Conclusions

There is a quick method to check to see if two ratios are equal. It is called the **cross products** method. Follow these steps.

Step 1: Multiply factors that cross diagonally in the two ratios.

$$\frac{4}{5} \times \frac{12}{15}$$

5×12

4×15

Step 2: If the products of cross factors are the same, the two ratios are equal.

The cross products of 60 are the same.

So, $\frac{4}{5}$ and $\frac{12}{15}$ are equal ratios. $\rightarrow \frac{4}{5} \times \frac{12}{15}$ 60 60

Two equal ratios form a **proportion.** $\frac{4}{5} = \frac{12}{15}$ is a proportion.

If cross products are not the same, the two ratios are not equal.

Is $\frac{4}{6} \stackrel{?}{=} \frac{5}{9}$?

$6 \times 5 = 30$

$\frac{4}{6} \times \frac{5}{9}$

$4 \times 9 = 36$

The cross products are not equal.

$\frac{4}{6} = \frac{5}{9}$ **is not** a proportion, so $\frac{4}{6} \neq \frac{5}{9}$.

Use the cross products method to tell whether the two ratios are equal. Show your work. Write yes or no.

1. $\frac{2}{4}$ and $\frac{6}{12}$ _____

2. $\frac{2}{5}$ and $\frac{5}{10}$ _____

3. $\frac{6}{9}$ and $\frac{8}{12}$ _____

4. $\frac{3}{9}$ and $\frac{4}{10}$ _____

5. How can you tell if two ratios form a proportion?

_____

_____

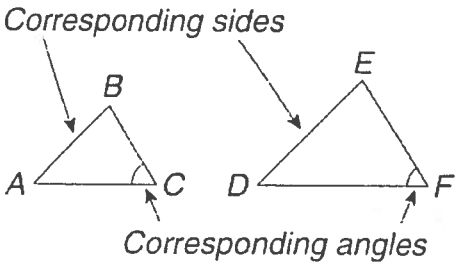
Name _____ Date _____ Class _____

LESSON 4-1

Similar Shapes and Proportions

Success for English Learners

Problem 1

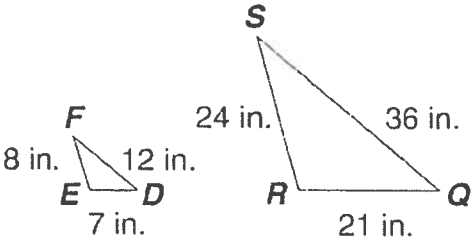


Two figures are similar if
- corresponding angles are equal.
- corresponding side lengths are in proportion.

1. Determine corresponding side lengths.
2. Write ratios comparing the corresponding side lengths.
3. Substitute the values for the sides.
4. Write the ratios with common denominators.
5. Are the ratios equivalent?

Problem 2

Similar figures have the same shape but different sizes.



Corresponding sides are sides that have the same position in each figure.

$\overline{DE}$ corresponds to $\overline{QR}$.
$\overline{EF}$ corresponds to $\overline{RS}$.
$\overline{DF}$ corresponds to $\overline{QS}$.

1. How can you tell if two figures are similar? Name two ways.

_____

_____

2. How can you tell if corresponding sides of two figures are proportional?

_____

_____

Name _____ Date _____ Class _____

LESSON 4-1

Similar Shapes and Proportions

Practice and Problem Solving: D

Tell whether the shapes are similar. Explain your answer. The first one is done for you.

1. rectangle *STUV* with side lengths of 5 and 3 and rectangle *WXYZ* with side lengths of 15 and 9

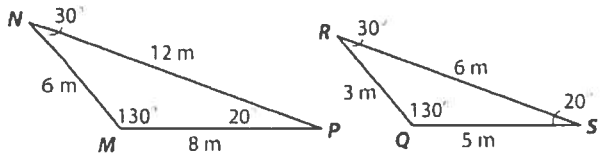
   Yes; All the angles are right angles, and the ratio of corresponding sides is 1:3.

2. rectangle *ABCD* with side lengths of 4 and 6 and rectangle *EFGH* with side lengths of 8 and 18

   _____

Tell whether the triangles are similar. Explain your answer. The first one is done for you.

3.



No; Corresponding side lengths are not proportional.

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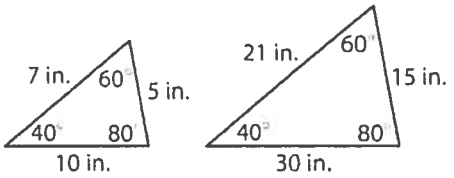
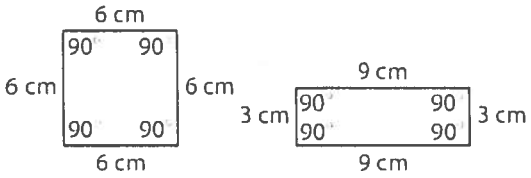


Tell whether the four-sided figures are similar. Explain your answer.

5.



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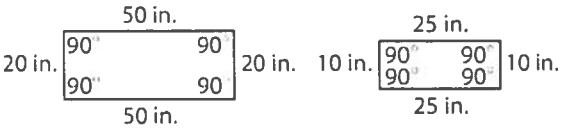


Name _____ Date _____ Class _____

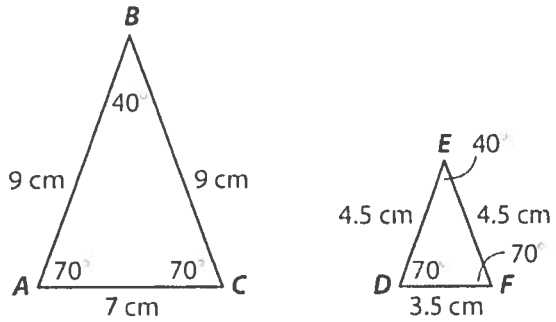
LESSON 4-1

Similar Shapes and Proportions

Practice and Problem Solving: A/B

Tell whether the triangles are similar. Explain your answer.

1.



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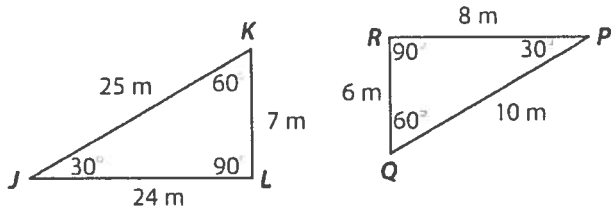

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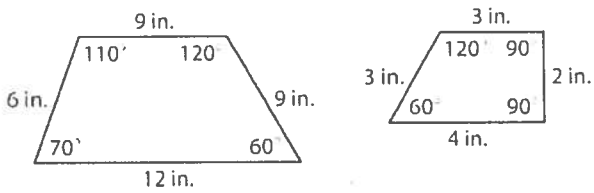

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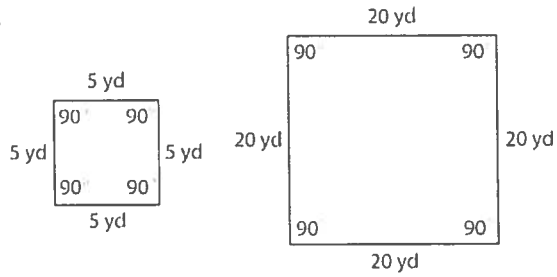

Solve

5. A rectangle made of square tiles measures 8 tiles wide and 10 tiles long. What is the length in tiles of a similar rectangle 12 tiles wide?

_____

6. A computer monitor is a rectangle. The display resolution of Monica's monitor is 240 pixels by 160 pixels. The display resolution of Eugene's monitor is 320 pixels by 200 pixels. Is Monica's monitor similar to Eugene's monitor? Explain.

_____

_____