Name _____ Date _____

8.2 Proving Triangle Similarity by AA

For use with Exploration 8.2

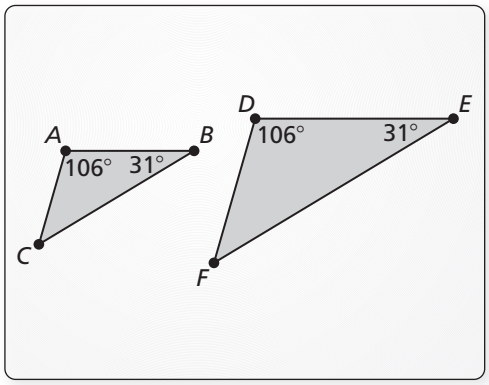
Essential Question What can you conclude about two triangles when you know that two pairs of corresponding angles are congruent?

1 EXPLORATION: Comparing Triangles

Go to *BigIdeasMath.com* for an interactive tool to investigate this exploration.

Work with a partner. Use dynamic geometry software.

a. Construct $\triangle ABC$ and $\triangle DEF$ so that $m\angle A = m\angle D = 106°$, $m\angle B = m\angle E = 31°$, and $\triangle DEF$ is not congruent to $\triangle ABC$.



b. Find the third angle measure and the side lengths of each triangle. Record your results in column 1 of the table below.

	1.	2.	3.	4.	5.	6.
$m\angle A, m\angle D$	106°	88°	40°			
$m\angle B, m\angle E$	31°	42°	65°			
$m\angle C$						
$m\angle F$						
AB						
DE						
BC						
EF						
AC						
DF						

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8.2 Proving Triangle Similarity by AA (continued)

1 EXPLORATION: Comparing Triangles (continued)

c. Are the two triangles similar? Explain.

d. Repeat parts (a)–(c) to complete columns 2 and 3 of the table for the given angle measures.

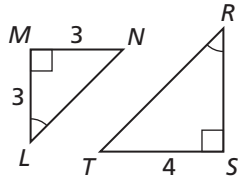
e. Complete each remaining column of the table using your own choice of two pairs of equal corresponding angle measures. Can you construct two triangles in this way that are *not* similar?

f. Make a conjecture about any two triangles with two pairs of congruent corresponding angles.

Communicate Your Answer

2. What can you conclude about two triangles when you know that two pairs of corresponding angles are congruent?

3. Find RS in the figure at the right.



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8.2 Notetaking with Vocabulary

For use after Lesson 8.2

In your own words, write the meaning of each vocabulary term.

similar figures

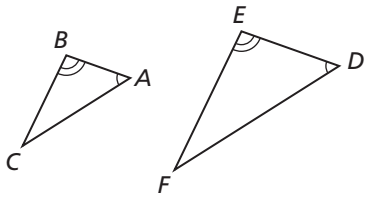
similarity transformation

Theorems

Theorem 8.3 Angle-Angle (AA) Similarity Theorem

If two angles of one triangle are congruent to two angles of another triangle, then the two triangles are similar.

If $\angle A \cong \angle D$ and $\angle B \cong \angle E$, then $\triangle ABC \sim \triangle DEF$.



Notes:

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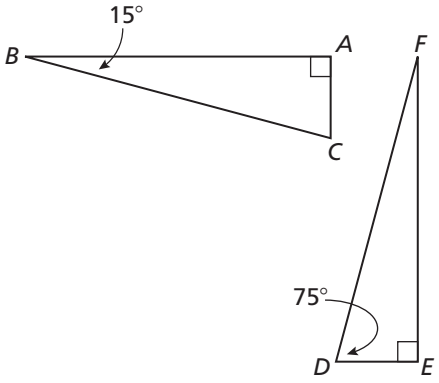
8.2 Notetaking with Vocabulary (continued)

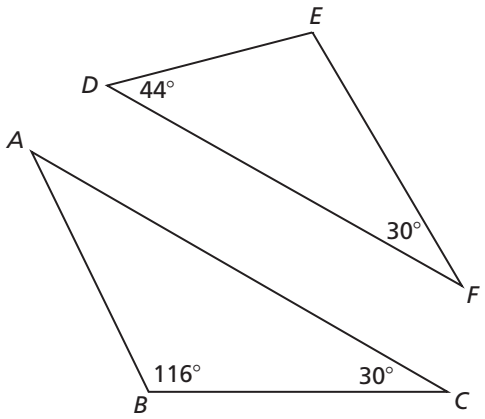
Extra Practice

In Exercises 1 and 2, determine whether the triangles are similar. If they are, write a similarity statement. Explain your reasoning.

1.

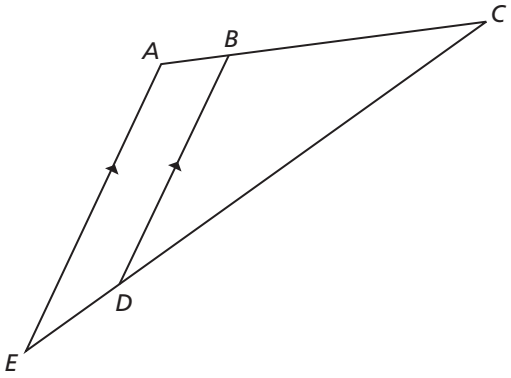


2.

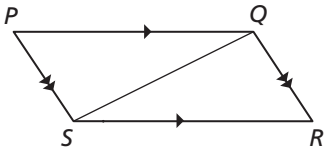


In Exercises 3 and 4, show that the two triangles are similar.

3.



4.



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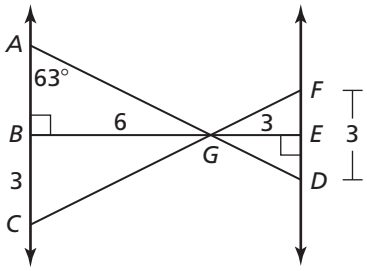
8.2 Notetaking with Vocabulary (continued)

In Exercises 5–13, use the diagram to complete the statement.



5. $m\angle AGB =$ _____

6. $m\angle EGD =$ _____

7. $m\angle BCG =$ _____

8. $AG =$ _____

9. $AB =$ _____

10. $FE =$ _____

11. $ED =$ _____

12. $GF =$ _____

13. $\triangle AGC \sim$ _____

14. Using the diagram for Exercises 5–13, write similarity statements for each triangle similar to $\triangle EFG$.

15. Determine if it is possible for $\triangle HJK$ and $\triangle PQR$ to be similar. Explain your reasoning.

$$m\angle H = 100°, m\angle K = 46°, m\angle P = 44°, \text{and } m\angle Q = 46°$$

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