Name_____ Date _____

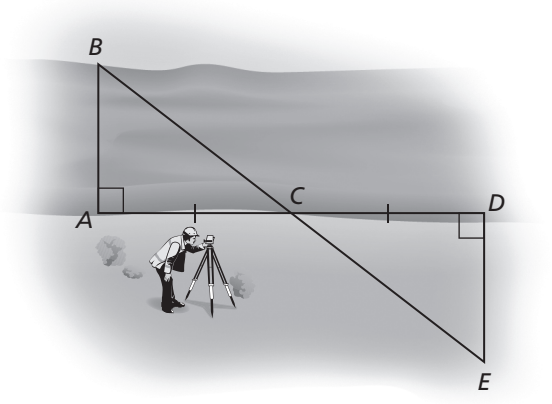
5.7 Using Congruent Triangles

For use with Exploration 5.7

Essential Question How can you use congruent triangles to make an indirect measurement?

1 EXPLORATION: Measuring the Width of a River

Work with a partner. The figure shows how a surveyor can measure the width of a river by making measurements on only one side of the river.



a. Study the figure. Then explain how the surveyor can find the width of the river.

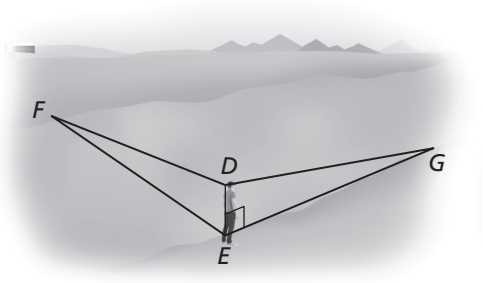
b. Write a proof to verify that the method you described in part (a) is valid.

Given $\angle A$ is a right angle, $\angle D$ is a right angle, $\overline{AC} \cong \overline{CD}$

c. Exchange proofs with your partner and discuss the reasoning used.

2 EXPLORATION: Measuring the Width of a River

Work with a partner. It was reported that one of Napoleon's officers estimated the width of a river as follows. The officer stood on the bank of the river and lowered the visor on his cap until the farthest thing visible was the edge of the bank on the other side. He then turned and noted the point on his side that was in line with the tip of his visor and his eye. The officer then paced the distance to this point and concluded that distance was the width of the river.



a. Study the figure. Then explain how the officer concluded that the width of the river is EG.

b. Write a proof to verify that the conclusion the officer made is correct.

Given $\angle DEG$ is a right angle, $\angle DEF$ is a right angle, $\angle EDG \cong \angle EDF$

c. Exchange proofs with your partner and discuss the reasoning used.

Communicate Your Answer

3. How can you use congruent triangles to make an indirect measurement?

4. Why do you think the types of measurements described in Explorations 1 and 2 are called *indirect* measurements?

Name_____ Date _____

5.7 Notetaking with Vocabulary

For use after Lesson 5.7

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

congruent figures

corresponding parts

construction

Notes:

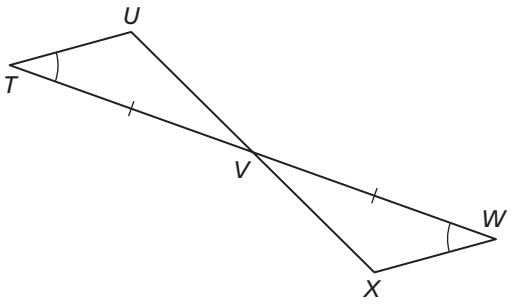
Name _____ Date _____

5.7 Notetaking with Vocabulary (continued)

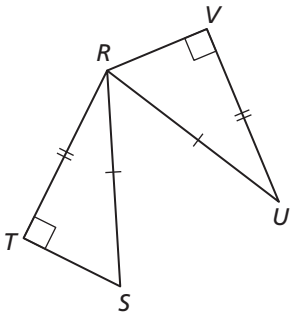
Extra Practice

In Exercises 1–3, explain how to prove that the statement is true.

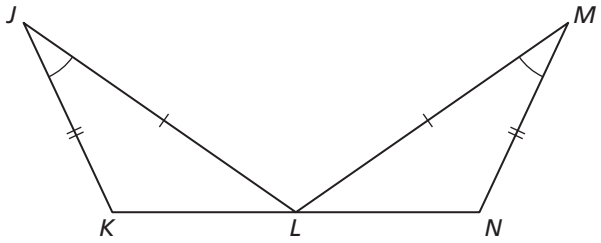
1. $\overline{UV} \cong \overline{XV}$



2. $\overline{TS} \cong \overline{VR}$

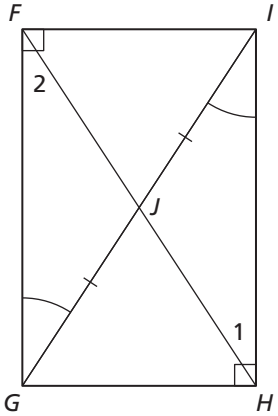


3. $\angle JLK \cong \angle MLN$



In Exercises 4 and 5, write a plan to prove that $\angle 1 \cong \angle 2$.

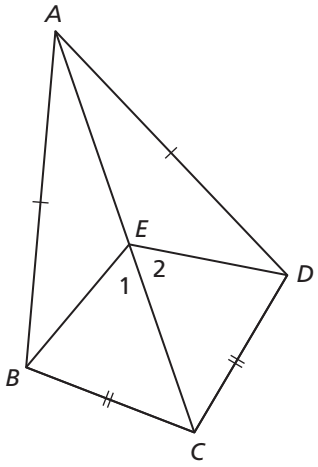
4.



Name_____ Date _____

5.7 Notetaking with Vocabulary (continued)

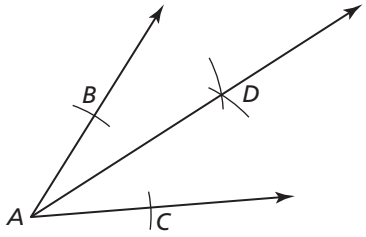
5.



6. Write a proof to verify that the construction is valid.

Ray bisects an angle

Plan for Proof Show that $\triangle ABD \cong \triangle ACD$ by the SSS Congruence Theorem (Thm. 5.8). Use corresponding parts of congruent triangles to show that $\angle BAD \cong \angle CAD$.



STATEMENTS	REASONS