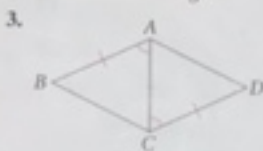
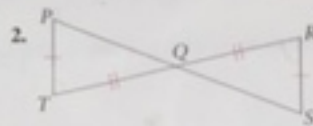
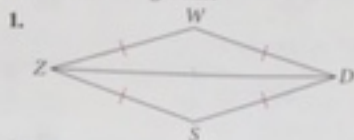


Problem Solving

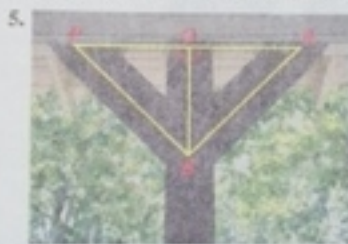
Example 1, 3 (pages 187-188)

**Developing Proof** Which postulate, if any, could you use to prove that the two triangles are congruent?



F is the midpoint of  $\overline{GL}$ .

**Developing Proof** Is the information you are given below each photograph enough for you to prove that the two triangles are congruent? Explain.



The vertical beam  $\overline{OB}$  is perpendicular to the porch roof. P, O, and R are equally spaced.

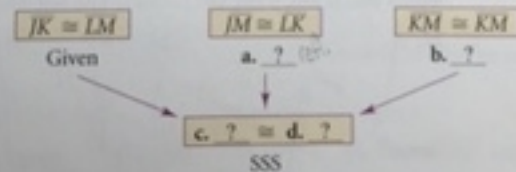
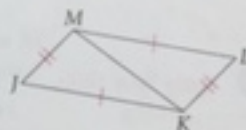


The diagonal legs have equal lengths and are joined at their midpoints.

7. **Developing Proof** Copy and complete the flow proof.

**Given:**  $\overline{JK} \cong \overline{LM}, \overline{JM} \cong \overline{LK}$

**Prove:**  $\triangle JKM \cong \triangle LMK$



Example 2 (page 188)

Copy the triangle. Start at any vertex and label the triangle as  $\triangle WVU$ .

8. What sides include  $\angle V$ ?
9. What angle is included between  $\overline{WV}$  and  $\overline{WU}$ ?
10. What angles include  $\overline{UV}$ ?
11. What side is included between  $\angle W$  and  $\angle U$ ?

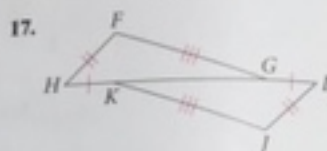
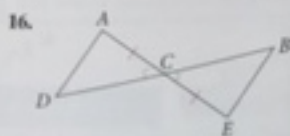
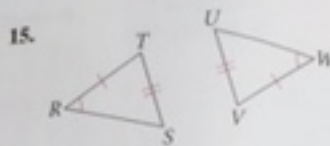
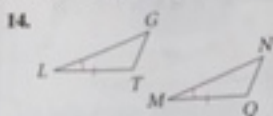


Name the indicated part(s) of  $\triangle XYZ$  without drawing  $\triangle XYZ$ .

12. the angle included between  $\overline{XY}$  and  $\overline{XZ}$

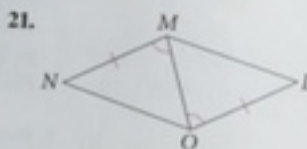
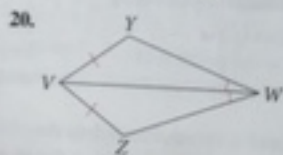
13. the sides that include  $\angle Z$

**Developing Proof** What other information, if any, do you need to prove the two triangles congruent by SSS or SAS?



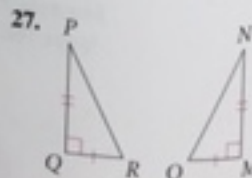
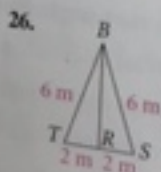
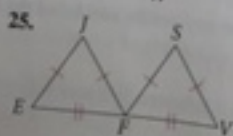
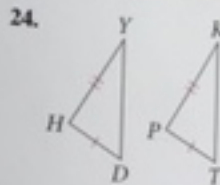
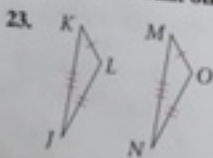
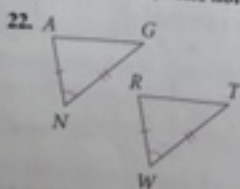
**Example 3**  
(page 188)

**Developing Proof** From the information given in the diagram, can you prove that the two triangles are congruent? Explain.

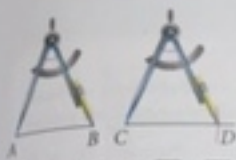


**Skills**

**Developing Proof** Is there enough information to prove the two triangles congruent? If so, write the congruence statement and name the postulate you would use. If not, write *not possible* and tell what other information you would need.



Congruent Triangles



When you construct  $\overline{AB} \cong \overline{CD}$ , SAS tells you that the triangles outlined here are congruent.

**Developing Proof** From the information given, can you prove the two triangles congruent? Explain.

28.  $\triangle ABC$  and  $\triangle DEF$  with  $\angle A \cong \angle D$ ,  $\angle B \cong \angle E$ ,  $\angle C \cong \angle F$

29.  $\triangle GHI$  and  $\triangle JKL$  with  $\overline{GH} \cong \overline{JK}$ ,  $\overline{HI} \cong \overline{KL}$ ,  $\angle I \cong \angle L$

30.  $\triangle MNP$  and  $\triangle QRS$  with  $\overline{MN} \cong \overline{QR}$ ,  $\angle N \cong \angle R$ ,  $\overline{NP} \cong \overline{RS}$

**Constructions** Use a straightedge to draw  $\triangle JKL$ . Construct  $\triangle MNP \cong \triangle JKL$  using the given postulate.

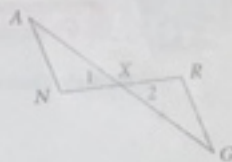
31. SSS

32. SAS

33. **Developing Proof** Supply the reasons in this proof.

**Given:**  $X$  is the midpoint of  $\overline{AG}$  and of  $\overline{NR}$ .

**Prove:**  $\triangle ANX \cong \triangle GRX$



Statements	Reasons
1. $\angle 1 \cong \angle 2$	a. ?
2. $X$ is the midpoint of $\overline{AG}$ .	b. ?
3. $\overline{AX} \cong \overline{GX}$	c. ?
4. $X$ is the midpoint of $\overline{NR}$ .	d. ?
5. $\overline{NX} \cong \overline{RX}$	e. ?
6. $\triangle ANX \cong \triangle GRX$	f. ?

34. **Error Analysis** A friend conjectures that there should be an AAA Congruence Postulate since there is a SSS Congruence Postulate. Give a counterexample to disprove your friend's conjecture.

35. a. **Open-Ended** List three real-life uses of congruent triangles.

b. **Writing** For each, tell whether you think congruence is necessary and why.

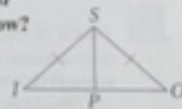
### Reading Math

For help with reading and solving Exercise 36, see p. 193.

**Developing Proof** What can you prove about  $\triangle ISP$  and  $\triangle OSP$  given the information in the diagram and the information below?

36.  $\overline{SP}$  is the bisector of  $\angle ISO$ .

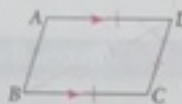
37.  $\overline{SP}$  is a bisector of  $\overline{IO}$ .



**Developing Proof** In  $ABCD$ ,  $\overline{AD} \parallel \overline{BC}$  and  $\overline{AD} \cong \overline{BC}$ . Can you prove the two triangles congruent? Explain.

38.  $\triangle ADB$  and  $\triangle CBD$

39.  $\triangle ABC$  and  $\triangle CDA$

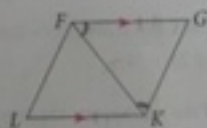


40. **Critical Thinking** Four sides of polygon  $ABCD$  are congruent to four sides of polygon  $EFGH$ . Must the two quadrilaterals also be congruent? Explain.

### Challenge Proof Write a proof.

41. **Given:**  $\overline{FG} \parallel \overline{KL}$ ,  $\overline{FG} \cong \overline{KL}$

**Prove:**  $\triangle FGK \cong \triangle KLF$



42. **Given:**  $\overline{AE}$  and  $\overline{BD}$  bisect each other.

**Prove:**  $\triangle ACB \cong \triangle ECD$

