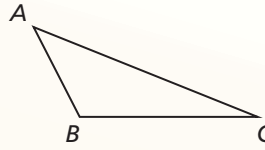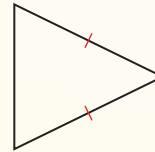## 5.1 Angles of Triangles *(pp. 231–238)*

Classify the triangle by its sides and by measuring its angles.

The triangle does not have any congruent sides, so it is scalene. The measure of $\angle B$ is $117°$, so the triangle is obtuse.
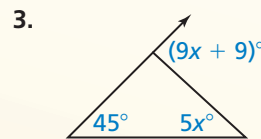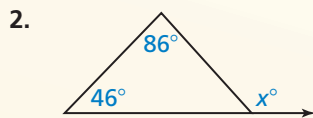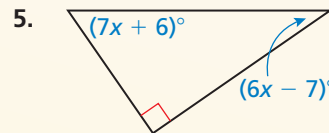
▶ The triangle is an obtuse scalene triangle.

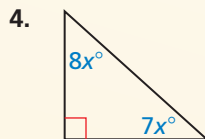1. Classify the triangle at the right by its sides and by measuring its angles.

Find the measure of the exterior angle.

2. $86°$, $46°$, $x°$

3. $(9x + 9)°$, $45°$, $5x°$

Find the measure of each acute angle.
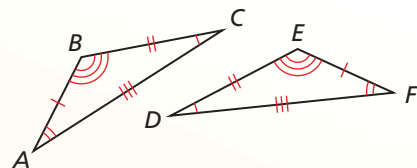
4. $8x°$, $7x°$

5. $(7x + 6)°$, $(6x - 7)°$

5.2 Congruent Polygons *(pp. 239–244)*

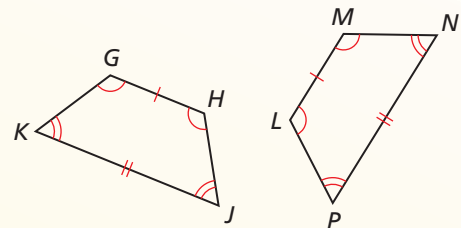**Write a congruence statement for the triangles. Identify all pairs of congruent corresponding parts.**

The diagram indicates that $\triangle ABC \cong \triangle FED$.

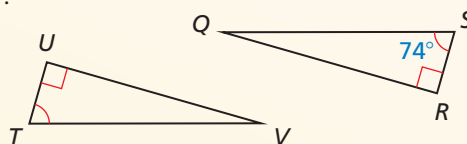**Corresponding angles** $\angle A \cong \angle F$, $\angle B \cong \angle E$, $\angle C \cong \angle D$

Corresponding sides $\overline{AB} \cong \overline{FE}$, $\overline{BC} \cong \overline{ED}$, $\overline{AC} \cong \overline{FD}$

6. In the diagram, $GHJK \cong LMNP$. Identify all pairs of congruent corresponding parts. Then write another congruence statement for the quadrilaterals.
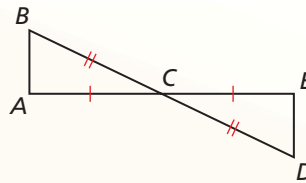
7. Find $m\angle V$.

$74°$

## 5.3 Proving Triangle Congruence by SAS (pp. 245–250)

Write a proof.

Given $\overline{AC} \cong \overline{EC}, \overline{BC} \cong \overline{DC}$

Prove $\triangle ABC \cong \triangle EDC$

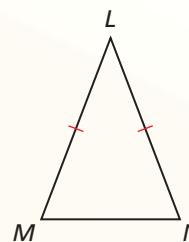| STATEMENTS	REASONS
1. $\overline{AC} \cong \overline{EC}$	**1.** Given
2. $\overline{BC} \cong \overline{DC}$	**2.** Given
3. $\angle ACB \cong \angle ECD$	**3.** Vertical Angles Congruence Theorem (Theorem 2.6)
4. $\triangle ABC \cong \triangle EDC$	**4.** SAS Congruence Theorem (Theorem 5.5)

Decide whether enough information is given to prove that $\triangle WXZ \cong \triangle YZX$ using the SAS Congruence Theorem (Theorem 5.5). If so, write a proof. If not, explain why.

8.

9.
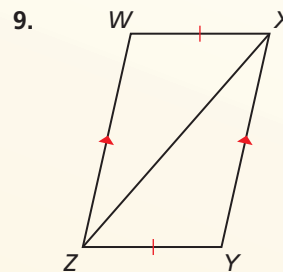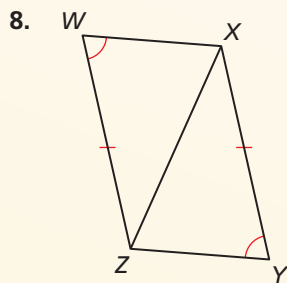
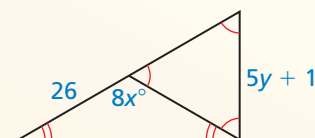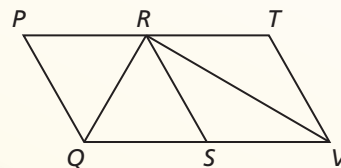## 5.4 Equilateral and Isosceles Triangles (pp. 251–258)

In $\triangle LMN, \overline{LM} \cong \overline{LN}$. Name two congruent angles.

▶ $\overline{LM} \cong \overline{LN}$, so by the Base Angles Theorem (Theorem 5.6), $\angle M \cong \angle N$.

Copy and complete the statement.

10. If $\overline{QP} \cong \overline{QR}$, then $\angle$___ $\cong \angle$___.

11. If $\angle TRV \cong \angle TVR$, then ___ $\cong$ ___.

12. If $\overline{RQ} \cong \overline{RS}$, then $\angle$___ $\cong \angle$___.

13. If $\angle SRV \cong \angle SVR$, then ___ $\cong$ ___.

14. Find the values of x and y in the diagram.
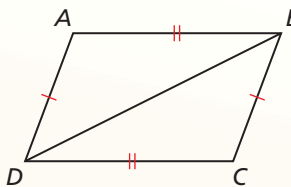
26   $8x°$ $5y + 1$

5.5 Proving Triangle Congruence by SSS (pp. 261–268)
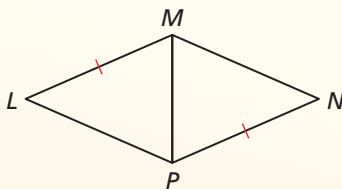
Write a proof.

Given $\overline{AD} \cong \overline{CB}, \overline{AB} \cong \overline{CD}$

Prove $\triangle ABD \cong \triangle CDB$

STATEMENTS	REASONS
1. $\overline{AD} \cong \overline{CB}$	1. Given
2. $\overline{AB} \cong \overline{CD}$	2. Given
3. $\overline{BD} \cong \overline{DB}$	3. Reflexive Property of Congruence (Theorem 2.1)
4. $\triangle ABD \cong \triangle CDB$	4. SSS Congruence Theorem (Theorem 5.8)

15. Decide whether enough information is given to prove that $\triangle LMP \cong \triangle NPM$ using the SSS Congruence Theorem (Thm. 5.8). If so, write a proof. If not, explain why.

16. Decide whether enough information is given to prove that $\triangle WXZ \cong \triangle YZX$ using the HL Congruence Theorem (Thm. 5.9). If so, write a proof. If not, explain why.
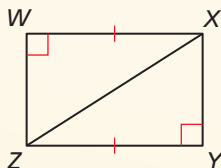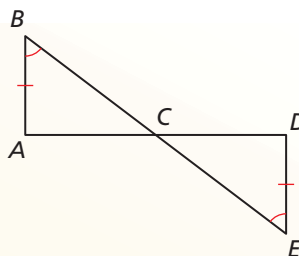
5.6 Proving Triangle Congruence by ASA and AAS (pp. 269–276)

Write a proof.

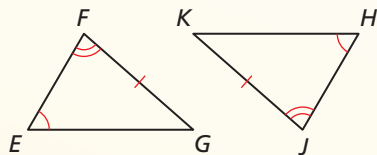**Given** $\overline{AB} \cong \overline{DE}, \angle ABC \cong \angle DEC$

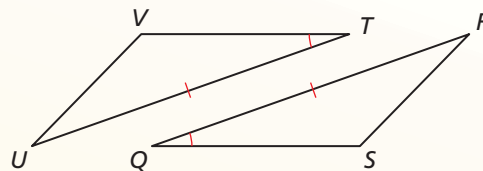**Prove** $\triangle ABC \cong \triangle DEC$

STATEMENTS	REASONS
1. $\overline{AB} \cong \overline{DE}$	1. Given
2. $\angle ABC \cong \angle DEC$	2. Given
3. $\angle ACB \cong \angle DCE$	3. Vertical Angles Congruence Theorem (Thm. 2.6)
4. $\triangle ABC \cong \triangle DEC$	4. AAS Congruence Theorem (Thm. 5.11)

Decide whether enough information is given to prove that the triangles are congruent using the AAS Congruence Theorem (Thm. 5.11). If so, write a proof. If not, explain why.

17. △EFG, △HJK

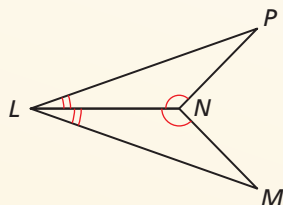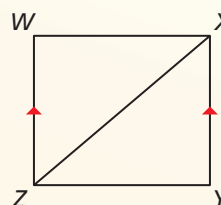**18.** △TUV, △QRS

Decide whether enough information is given to prove that the triangles are congruent using the ASA Congruence Theorem (Thm. 5.10). If so, write a proof. If not, explain why.
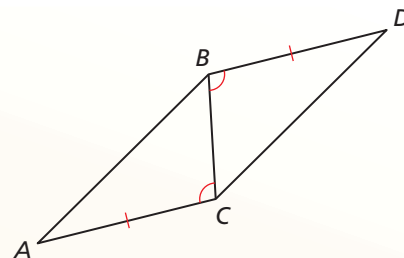
19. △LPN, △LMN

20. △WXZ, △YZX

5.7 **Using Congruent Triangles** *(pp. 277–282)*

Explain how you can prove that ∠A ≅ ∠D.

If you can show that △ABC ≅ △DCB, then you will know that ∠A ≅ ∠D. You are given $\overline{AC} \cong \overline{DB}$ and ∠ACB ≅ ∠DBC. You know that $\overline{BC} \cong \overline{CB}$ by the Reflexive Property of Congruence (Thm. 2.1). Two pairs of sides and their included angles are congruent, so by the SAS Congruence Theorem (Thm. 5.5), △ABC ≅ △DCB.

▶ Because corresponding parts of congruent triangles are congruent, ∠A ≅ ∠D.

21. Explain how to prove that ∠K ≅ ∠N.
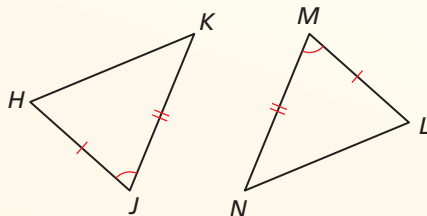
22. Write a plan to prove that ∠1 ≅ ∠2.