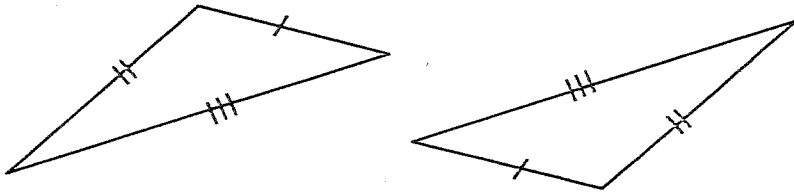
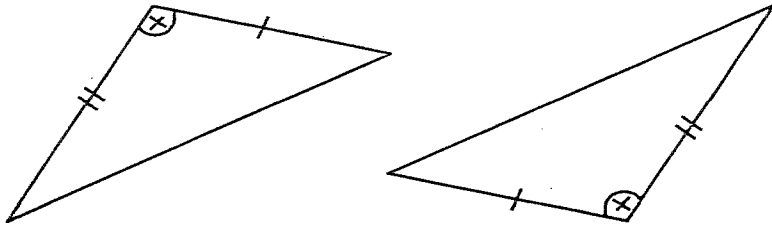


Two triangles are congruent if any one of the following is satisfied

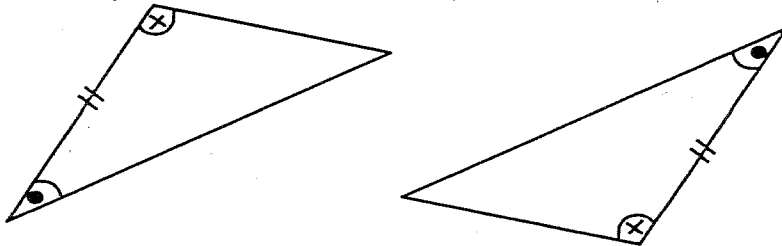
a) corresponding sides are equal (SSS):



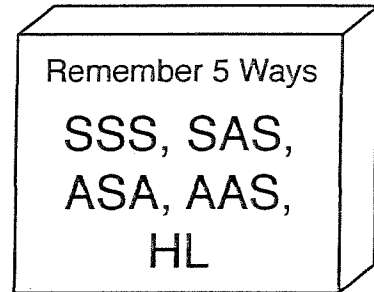
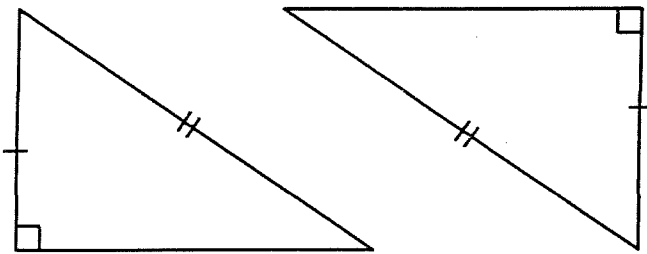
b) two sides and the included angle are equal (SAS)



c) two angles and a corresponding side are equal (ASA, AAS)



d) for right triangles, the hypotenuse and a corresponding side are equal



Note:

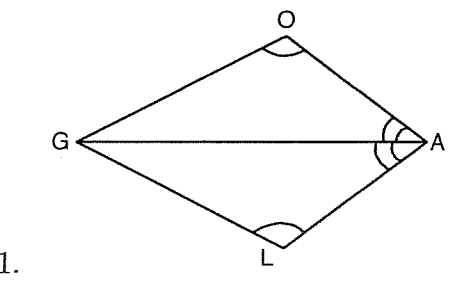
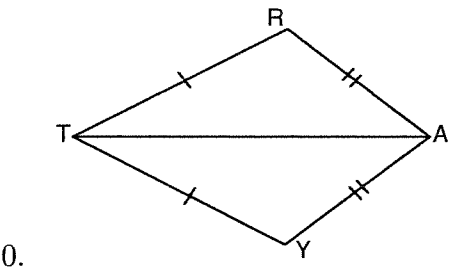
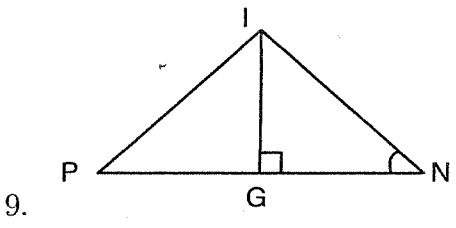
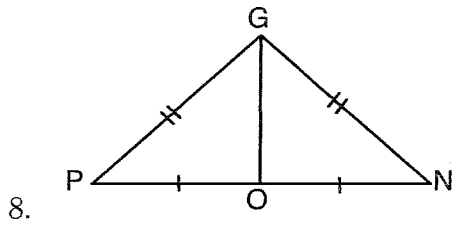
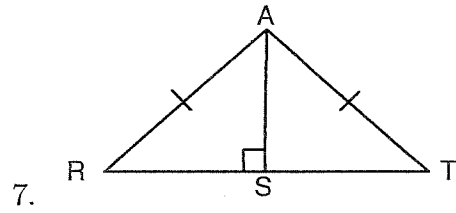
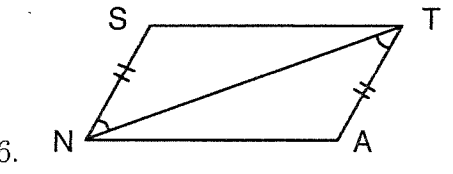
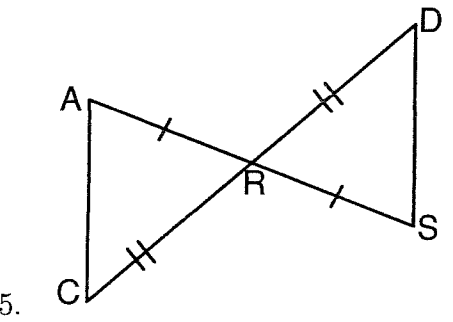
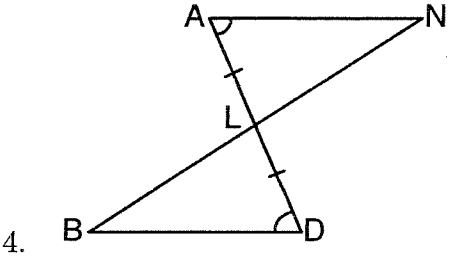
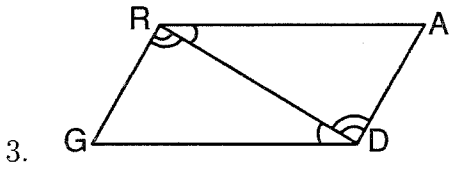
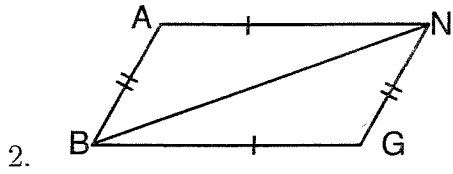
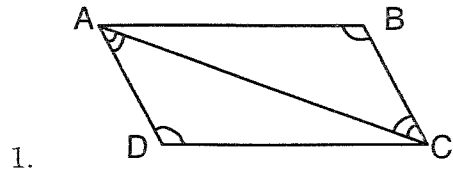
If  $\triangle ABC \cong \triangle PQR$ , then

$\angle A = \angle P$ ,  $\angle B = \angle Q$ ,  $\angle C = \angle R$

$AB = PQ$ ,  $BC = QR$ ,  $AC = PR$

CONCLUSIONS FROM FIGURES

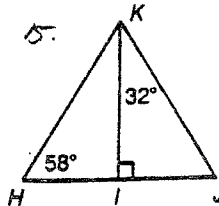
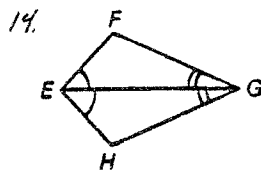
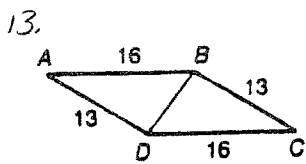
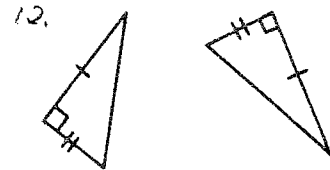
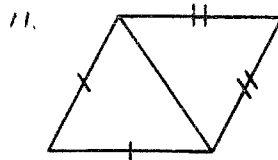
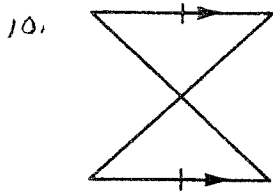
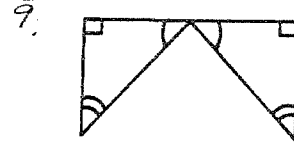
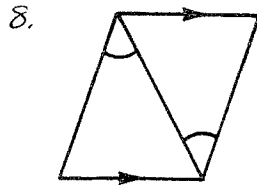
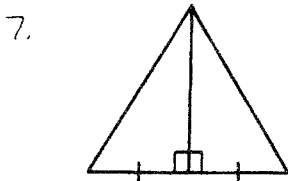
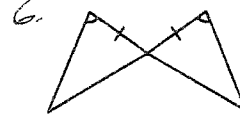
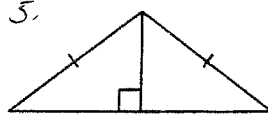
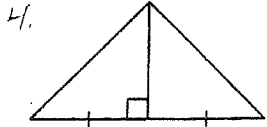
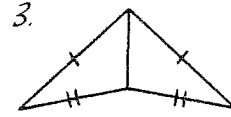
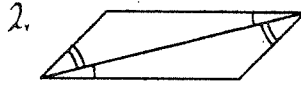
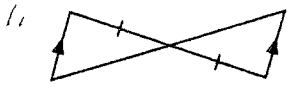
Study the markings on each of the following figures and then make as many conclusions as you can. Write down your conclusions and explanations for them on a piece of paper.



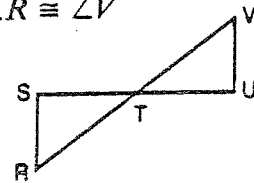
NAME \_\_\_\_\_

# Congruent Triangles

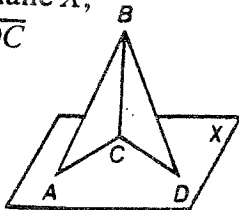
State which congruence method(s), SSS, SAS, ASA, AAS, or HL, can be used to prove the triangles congruent.



16.  $\angle S$  and  $\angle U$  are right angles;  
 $\angle R \cong \angle V$

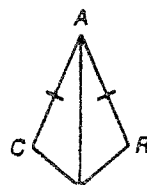


17.  $\overrightarrow{BC} \perp \text{plane } X$ ;  
 $\overline{AC} \cong \overline{DC}$

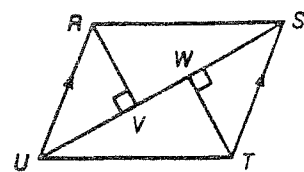


Indicate the additional information needed to prove the triangles congruent by the method shown.

18.  $\triangle SAC \cong \triangle SAR$  by SSS



19.  $\triangle RUV \cong \triangle TSW$  by ASA

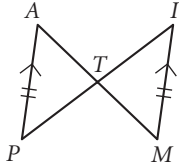


# Lesson 4.4 • Are There Congruence Shortcuts?

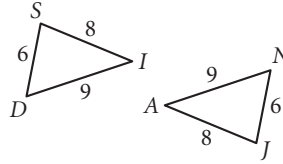
Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

In Exercises 1–3, name the conjecture that leads to each congruence.

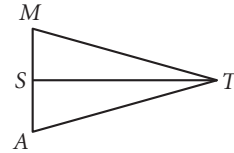
1.  $\triangle PAT \cong \triangle IMT$



2.  $\triangle SID \cong \triangle JAN$



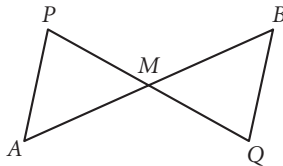
3.  $\overline{TS}$  bisects  $\overline{MA}$ ,  $\overline{MT} \cong \overline{AT}$ , and  $\triangle MST \cong \triangle AST$



In Exercises 4–9, name a triangle congruent to the given triangle and state the congruence conjecture. If you cannot show any triangles to be congruent from the information given, write “cannot be determined” and redraw the triangles so that they are clearly not congruent.

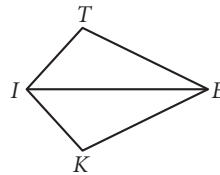
4.  $M$  is the midpoint of  $\overline{AB}$  and  $\overline{PQ}$ .

$\triangle APM \cong \triangle$  \_\_\_\_\_

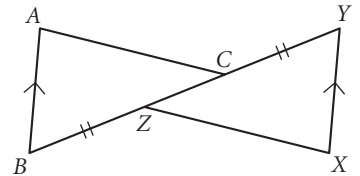


5.  $KITE$  is a kite with  $KI = TI$ .

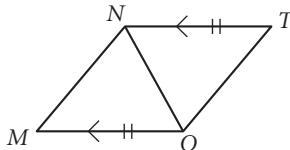
$\triangle KIE \cong \triangle$  \_\_\_\_\_



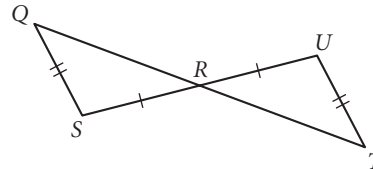
6.  $\triangle ABC \cong$  \_\_\_\_\_



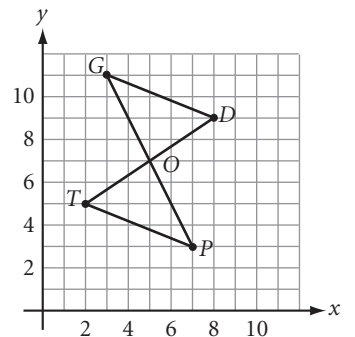
7.  $\triangle MON \cong$  \_\_\_\_\_



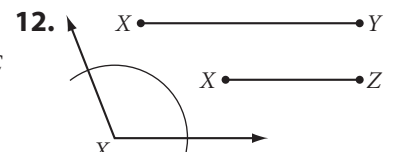
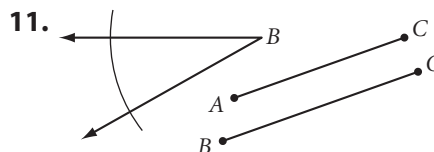
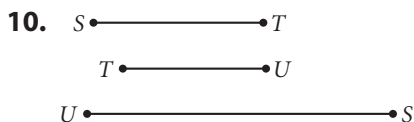
8.  $\triangle SQR \cong$  \_\_\_\_\_



9.  $\triangle TOP \cong$  \_\_\_\_\_



In Exercises 10–12, use a compass and a straightedge or patty paper and a straightedge to construct a triangle with the given parts. Then, if possible, construct a different (noncongruent) triangle with the same parts. If it is not possible, explain why not.

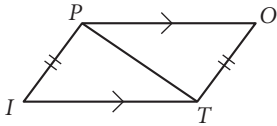


# Lesson 4.5 • Are There Other Congruence Shortcuts?

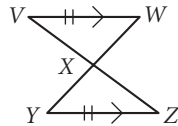
Name \_\_\_\_\_ Period \_\_\_\_\_ Date \_\_\_\_\_

In Exercises 1–6, name a triangle congruent to the given triangle and state the congruence conjecture. If you cannot show any triangles to be congruent from the information given, write “cannot be determined” and explain why.

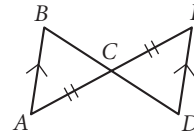
1.  $\triangle PIT \cong \triangle$  \_\_\_\_\_



2.  $\triangle XVW \cong \triangle$  \_\_\_\_\_

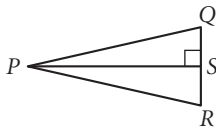


3.  $\triangle ECD \cong \triangle$  \_\_\_\_\_

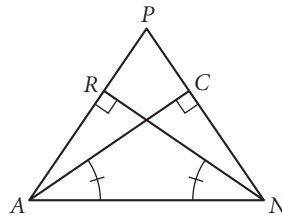


4.  $\overline{PS}$  is the angle bisector of  $\angle QPR$ .

$\triangle PQS \cong \triangle$  \_\_\_\_\_

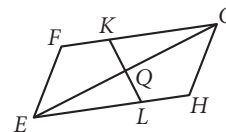


5.  $\triangle ACN \cong \triangle$  \_\_\_\_\_

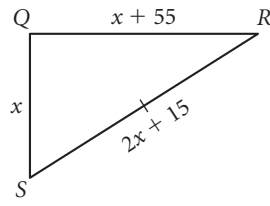
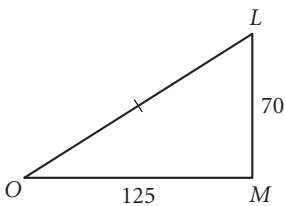


6.  $EFGH$  is a parallelogram.  
 $GQ = EQ$ .

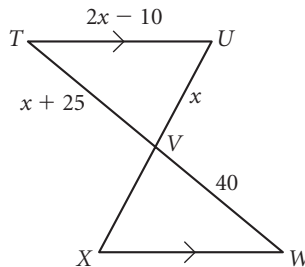
$\triangle EQL \cong \triangle$  \_\_\_\_\_



7. The perimeter of  $\triangle QRS$  is 350 cm.  
Is  $\triangle QRS \cong \triangle MOL$ ? Explain.

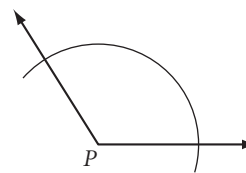
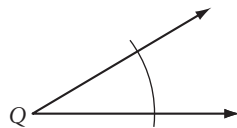


8. The perimeter of  $\triangle TUV$  is 95 cm.  
Is  $\triangle TUV \cong \triangle WXV$ ? Explain.

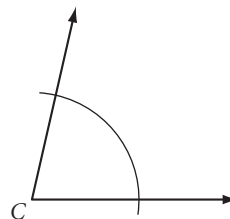
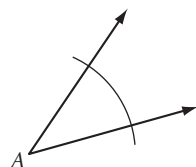


In Exercises 9 and 10, construct a triangle with the given parts. Then, if possible, construct a different (noncongruent) triangle with the same parts. If it is not possible, explain why not.

9.  $P$  —————  $Q$



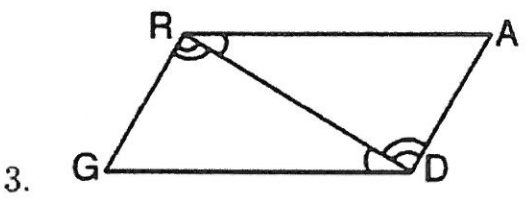
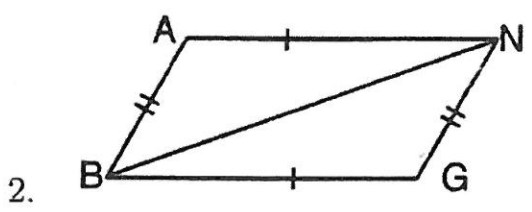
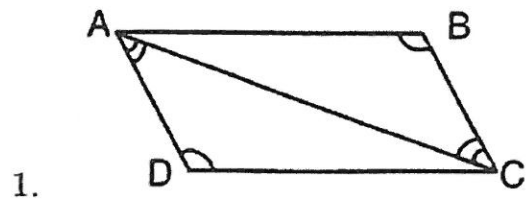
10.  $A$  —————  $B$



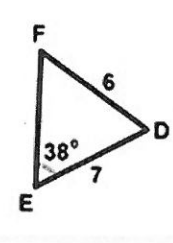
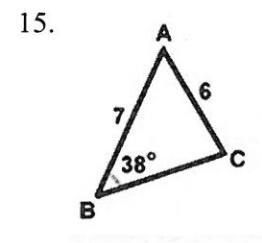
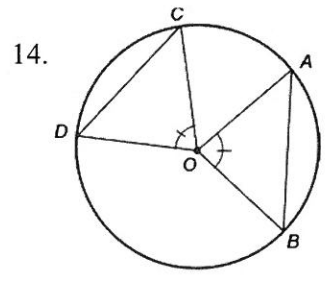
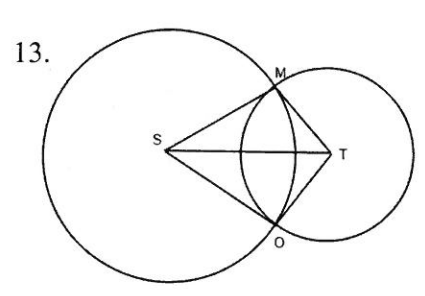
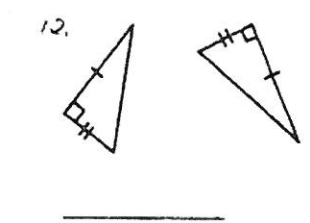
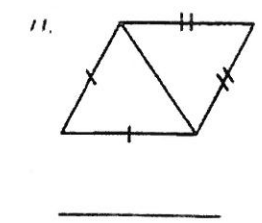
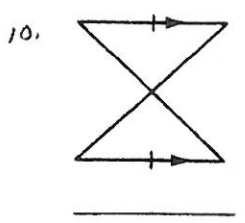
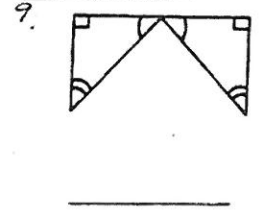
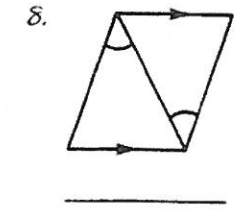
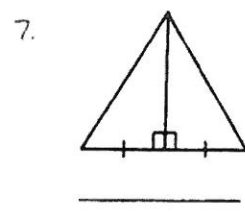
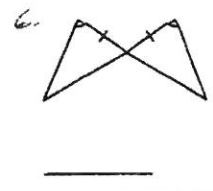
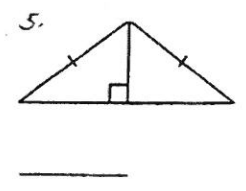
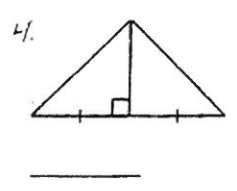
Name: \_\_\_\_\_

**5.3 Triangle Congruence Shortcuts Practice**

Study the markings on each of the following figures and write down as many conclusions as you can for can.

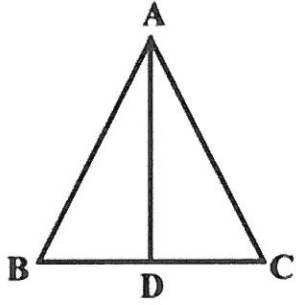


State if the triangles are congruent, and if so, which congruence shortcut proves them to be congruent.



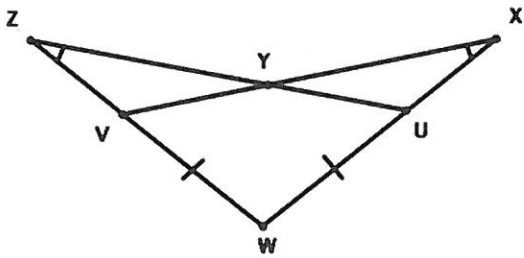
16. Given: Triangle ABC is isosceles with vertex angle A,  $\overline{AD}$  bisects  $\angle BAC$

Prove:  $\triangle BAD \cong \triangle CAD$



17. Given:  $\angle Z \cong \angle X$  and  $\overline{VW} \cong \overline{WU}$

Prove:  $\triangle ZUW \cong \triangle XVW$



18. Given:  $\triangle ABD \cong \triangle CBD$ , Prove:  $\triangle EBA \cong \triangle ECB$

