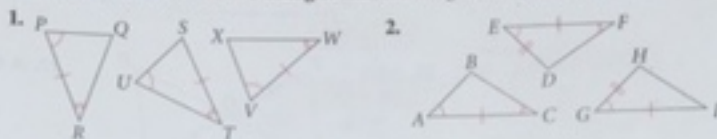


Problem Solving

Example

Developing Proof Name two triangles that are congruent by the ASA Postulate.Example 1
(see 195)

Answer each question without drawing the triangle.

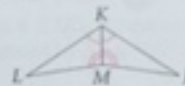
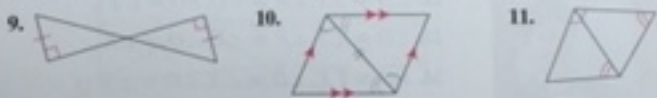
3. Which side is included between $\angle R$ and $\angle S$ in $\triangle RST$?
4. Which angles include \overline{NO} in $\triangle NOM$?

Example 2
(see 195)**Developing Proof** Tell whether the ASA Postulate can be used to prove the triangles congruent. If not, write *not possible*.**8. Developing Proof** Complete the paragraph proof by filling in the blanks.

Given: $\angle LKM = \angle JKM$,
 $\angle LMK = \angle JMK$

Prove: $\triangle LKM = \triangle JKM$

Proof: $\angle LKM = \angle JKM$ and $\angle LMK = \angle JMK$ are given. $\overline{KM} = \overline{KM}$ by the **a.** ? Property of Congruence.
 $\triangle LKM = \triangle JKM$ by the **b.** ? Postulate.

Example 3
(see 196)**Developing Proof** Tell whether the AAS Theorem or the ASA Postulate can be applied directly to prove the triangles congruent. If not, write *not possible*.

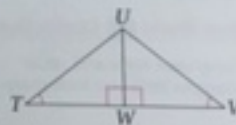
12. $\angle E = \angle I$ and $\overline{FE} = \overline{GI}$. What else must you know to prove $\triangle FDE = \triangle GHI$ by AAS? by ASA?

13. Developing Proof Complete the proof plan by filling in the blanks.

Given: $\angle UWT$ and $\angle UWV$ are right angles,
 $\angle T = \angle V$.

Prove: $\triangle UWT = \triangle UWV$

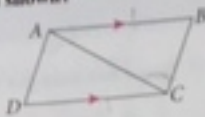
Plan: $\triangle UWT = \triangle UWV$ by AAS if $\angle T = \angle V$,
 $\angle UWT = \mathbf{a.}$?, and $\overline{UW} = \mathbf{b.}$?.
 $\angle UWT = \angle UWV$ because all **c.** ? angles are congruent.
 $\overline{UW} = \overline{UW}$ by the **d.** ? Property of Congruence.



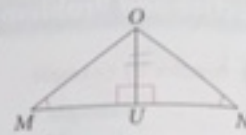
Example 4
(page 196)

Developing Proof What else must you know to prove the triangles congruent for the reason shown?

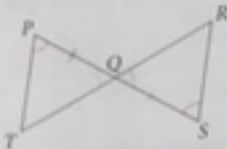
14. AAS



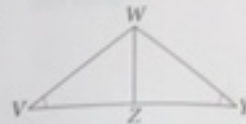
15. SAS



16. ASA



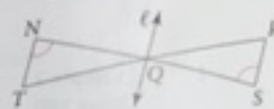
17. AAS



18. **Developing Proof** Complete the two-column proof by filling in the blanks.

Given: $\angle N \cong \angle S$, line ℓ bisects \overline{TR} at Q .

Prove: $\triangle NQT \cong \triangle SQR$

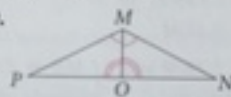


Statements	Reasons
1. $\angle N \cong \angle S$	1. Given
2. $\angle NQT \cong \angle SQR$	a. ?
3. ℓ bisects \overline{TR} at Q .	b. ?
c. ?	4. Definition of bisect
5. $\triangle NQT \cong \triangle SQR$	d. ?

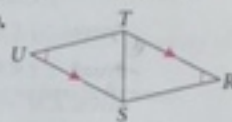
Apply Your Skills

Developing Proof Write a congruence statement for each pair of triangles. Name the postulate or theorem that justifies your statement.

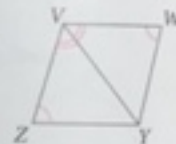
19.



20.



21.



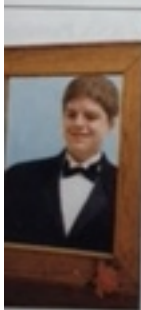
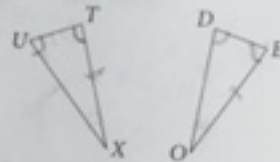
Developing Proof If the two triangles are congruent for the given conditions, write a congruence statement. Justify your conclusion.

22. $\angle D \cong \angle T$, $\angle E \cong \angle U$, $\overline{EO} \cong \overline{UX}$

23. $\angle D \cong \angle T$, $\angle E \cong \angle U$, $\angle O \cong \angle X$

24. $\overline{DO} \cong \overline{TX}$, $\angle D \cong \angle X$, $\angle O \cong \angle T$

25. $\overline{EO} \cong \overline{UX}$, $\angle E \cong \angle U$, $\overline{DO} \cong \overline{TX}$



Connection

el and collar
you look sharp.

Developing Proof In Exercises 27–29, complete each proof or proof plan.

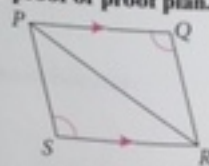
27. Given: $\overline{PQ} \parallel \overline{SR}$, $\angle Q \cong \angle S$

Prove: $\triangle QPR \cong \triangle SRP$

Plan: $\triangle QPR \cong \triangle SRP$ by AAS if

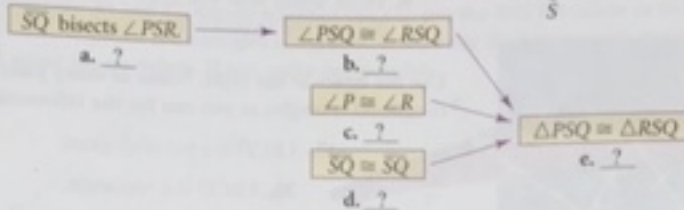
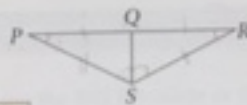
$\angle Q \cong \angle S$, $\angle QPR \cong$ a. ?, and $\overline{PR} \cong$ b. ?.

$\angle QPR \cong \angle SRP$ because they are c. ? angles for the given parallel lines and the transversal d. ?. $\overline{PR} \cong \overline{PR}$ by the e. ? Property of Congruence.



28. Given: \overline{SQ} bisects $\angle PSR$, $\angle P \cong \angle R$.

Prove: $\triangle PSQ \cong \triangle RSQ$



29. Given: $\overline{PQ} \perp \overline{QS}$, $\overline{RS} \perp \overline{QS}$,
 T is the midpoint of \overline{PR} .

Prove: $\triangle PQT \cong \triangle RST$

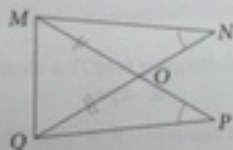


Statements	Reasons
1. $\overline{PQ} \perp \overline{QS}$, $\overline{RS} \perp \overline{QS}$	1. Given
2. $\angle Q$ and $\angle S$ are right angles.	a. ?
3. $\angle Q \cong \angle S$	b. ?
c. ?	4. Vertical angles are congruent.
5. T is the midpoint of \overline{PR} .	5. Given
6. $\overline{PT} \cong \overline{RT}$	d. ?
7. $\triangle PQT \cong \triangle RST$	e. ?

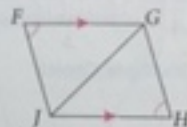
30. **Constructions** Using a straightedge, draw a triangle. Label it $\triangle JKL$. Construct $\triangle MNP \cong \triangle JKL$ so you know that the triangles are congruent by ASA.

Developing Proof Can you deduce the "Conclusion" from the "Given" information? Explain.

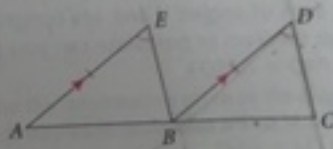
31. Given: $\angle N \cong \angle P$, $\overline{MO} \cong \overline{QO}$
Conclusion: $\triangle MON \cong \triangle QOP$



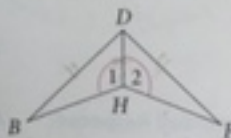
32. Given: $\angle F \cong \angle H$, $\overline{FG} \parallel \overline{JH}$
Conclusion: $\triangle FGJ \cong \triangle HJG$



33. Given: $\overline{AE} \parallel \overline{BD}$, $\overline{AE} \cong \overline{BD}$,
 $\angle E \cong \angle D$
Conclusion: $\triangle AEB \cong \triangle BDC$



34. Given: \overline{DH} bisects $\angle BDF$,
 $\angle 1 \cong \angle 2$
Conclusion: $\triangle BDH \cong \triangle FDH$



35. **Reasoning** If possible, draw two noncongruent triangles that have two pairs of congruent angles and one pair of congruent sides. If this is not possible, explain why.