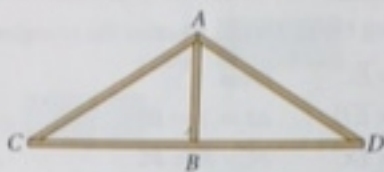


Problem Solving

Example 1
(page 180)

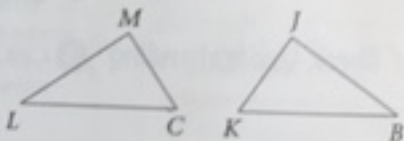
1. **Building** Builders use the King Post truss, below left, for the top of a simple structure. In this truss, $\triangle ABC \cong \triangle ABD$. List the congruent corresponding parts.



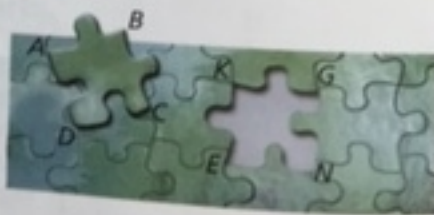
2. The Attic Frame truss, above right, provides open space in the center for storage. In this truss, $\triangle EFG \cong \triangle HIJ$. List the congruent corresponding parts.

$\triangle LMC \cong \triangle BJK$. Complete the congruence statements.

3. $\overline{LC} \cong \underline{\hspace{1cm}}$ 4. $\overline{KJ} \cong \underline{\hspace{1cm}}$
 5. $\angle B \cong \underline{\hspace{1cm}}$ 6. $\angle L \cong \underline{\hspace{1cm}}$
 7. $\angle K \cong \underline{\hspace{1cm}}$ 8. $\angle M \cong \underline{\hspace{1cm}}$
 9. $\triangle CML \cong \underline{\hspace{1cm}}$ 10. $\triangle KBJ \cong \underline{\hspace{1cm}}$
 11. $\triangle MLC \cong \underline{\hspace{1cm}}$ 12. $\triangle JKB \cong \underline{\hspace{1cm}}$



13. The last piece of the jigsaw puzzle must be put into place. Name the corners that correspond to corners A, B, C, and D.



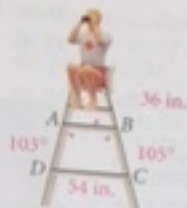
POLY \cong SIDE. List each of the following.

14. four pairs of congruent sides 15. four pairs of congruent angles

Congruent Triangles

Example 2
(page 181)

In the two lifeguard chairs, $ABCD \cong FGHI$. Find the measure of the angle or the length of the side.



16. \overline{AD} 17. \overline{HI}
 18. $\angle FGH$ 19. $\angle ADC$
 20. \overline{FG} 21. \overline{BC}
 22. $\angle DCB$ 23. $\angle IFG$



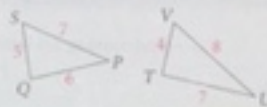
Example 3
(page 181)

Developing Proof In Exercises 24–27, can you conclude the figures are congruent? Justify each answer.

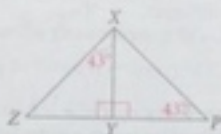
24. $\triangle TRK$ and $\triangle TUK$



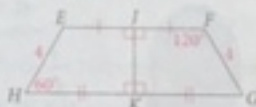
25. $\triangle SPQ$ and $\triangle TUV$



26. $\triangle XYZ$ and $\triangle XYP$



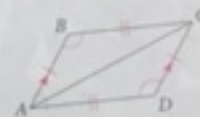
27. $HEJK$ and $GFJK$



Example 4
(page 182)

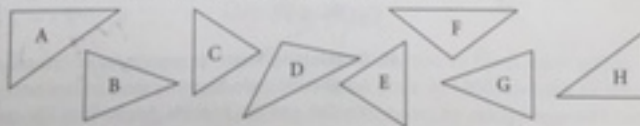
28. Developing Proof Use the information given in the diagram. Tell why each statement is true.

- a. $\overline{AB} \parallel \overline{DC}$ b. $\angle CAB \cong \angle ACD$
 c. $\angle B \cong \angle D$ d. $\angle BCA \cong \angle DAC$
 e. $\overline{AC} \cong \overline{AC}$ f. $\overline{AB} \cong \overline{DC}, \overline{BC} \cong \overline{AD}$
 g. $\triangle ABC \cong \triangle CDA$

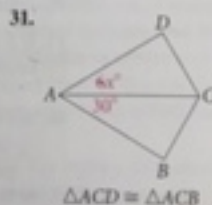
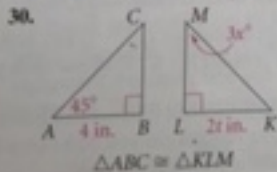


our Skills

29. Identify the pairs of triangles that appear to be congruent.



Algebra Find the values of the variables.



- Algebra** $\triangle ABC \cong \triangle DEF$. Find the measures of the given angles or the lengths of the given sides.

32. $m\angle A = x + 10$, $m\angle D = 2x$

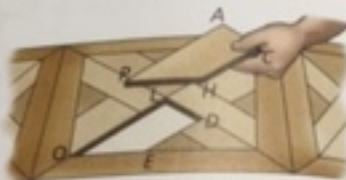
34. $BC = 3z + 2$, $EF = z + 6$

33. $m\angle B = 3y$, $m\angle E = 21$

35. $AC = 7a + 5$, $DF = 5a + 9$

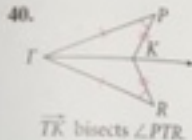
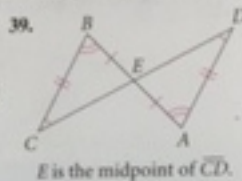
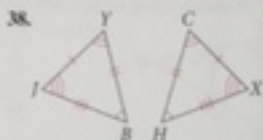
- Parquet Floor** Explain why it is important that $PACH = OLDE$.

- Sports Cards** The 225 cards in Tracy's sports card collection are rectangles of three different sizes. Describe how Tracy could quickly sort the cards.



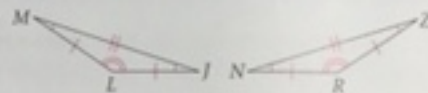
Exercise 36

Write a congruence statement for each pair of triangles.



41. Complete in two different ways:

$\triangle JLM \cong ?$



- Writing** Die-cast toys are a popular collector's item. Explain why the two die-cast toys that Pearl is studying at the left have congruent shapes.

- Open-Ended** Write a congruence statement for two triangles. List the congruent sides and angles.

- Developing Proof** Use the information given in the diagram. Tell why each statement is true.

a. $\overline{PR} \parallel \overline{TQ}$

b. $\angle PRS = \angle QTS$

c. $\angle RPS = \angle TQS$

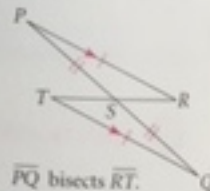
d. $\angle PSR = \angle QST$

e. $\overline{PR} \cong \overline{QT}$, $\overline{PS} \cong \overline{QS}$

f. \overline{PQ} bisects \overline{RT} .

g. $\overline{RS} \cong \overline{TS}$

h. $\triangle PRS \cong \triangle QTS$



- Developing Proof** If two angles of one triangle are congruent to two angles of another triangle, then the third angles are congruent (Theorem 4-1). Use algebra and the Triangle Angle-Sum Theorem to explain why this must be so.

Challenge

- Coordinate Geometry** Vertices of $\triangle GHJ$ are $G(-2, -1)$, $H(-2, 3)$, and $J(1, 3)$.

46. $\triangle KLM \cong \triangle GHJ$. Find KL , LM , and KM .

47. If L and M have coordinates $L(3, -3)$ and $M(6, -3)$, how many pairs of coordinates are possible for K ? Find one such pair.

48. a. How many quadrilaterals (convex and concave) with different shapes or sizes can you make on a three-by-three geoboard? One is shown at the right.
b. How many quadrilaterals of each type are there?

