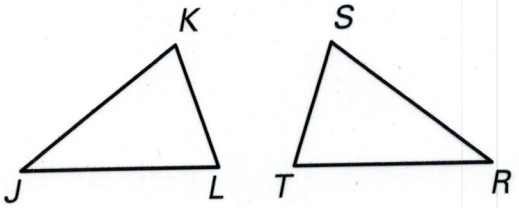
Answers for 4.2

For use with pages 228–231

4.2 Skill Practice

1. $\overline{JK} \cong \overline{RS}$, $\overline{KL} \cong \overline{ST}$, $\overline{JL} \cong \overline{RT}$, $\angle J \cong \angle R$, $\angle K \cong \angle S$, $\angle L \cong \angle T$;



2. 3 pairs of congruent sides and 3 pairs of congruent angles; to prove two figures congruent it must be shown that all corresponding sides and angles are congruent.

3. $\angle A$ and $\angle D$, $\angle C$ and $\angle F$, $\angle B$ and $\angle E$, $\overline{AB}$ and $\overline{DE}$, $\overline{AC}$ and $\overline{DF}$, $\overline{BC}$ and $\overline{EF}$.
Sample answer: $\triangle CAB \cong \triangle FDE$

4. $\angle G$ and $\angle Q$, $\angle H$ and $\angle R$, $\angle K$ and $\angle T$, $\angle J$ and $\angle S$, $\overline{GH}$ and $\overline{QR}$, $\overline{HJ}$ and $\overline{RS}$, $\overline{JK}$ and $\overline{ST}$, $\overline{KG}$ and $\overline{TQ}$.
Sample answer: $HJKG \cong RSTQ$

5. 124° **6.** 33° **7.** 8

8. $\overline{NL}$ **9.** $\triangle ZYX$ **10.** $\triangle NML$

11. $\triangle XYZ \cong \triangle ZWX$; all corresponding sides and angles are congruent.

12. The triangles cannot be proved congruent.

13. $\triangle BAG \cong \triangle CDF$; all corresponding sides and angles are congruent.

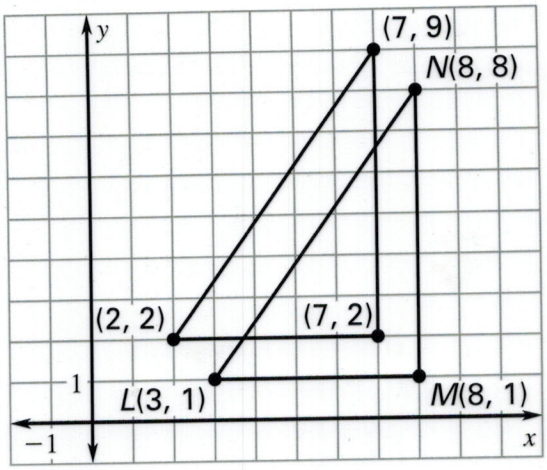
14. $VWXYZ \cong KLMNJ$ or $VWXYZ \cong MLKJN$; all corresponding sides and angles are congruent.

15. 20

16. 11

17. Student still needs to show that corresponding sides are congruent.

18. *Sample:*



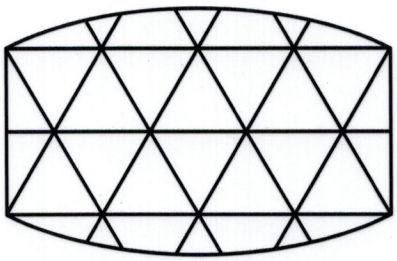
19. 3, 1 **20.** 5, 2 **21.** B

22. It is regular because all angles are congruent and all sides will be congruent because they are all connecting the midpoints of edges.

4.2 Problem Solving

23. Transitive Property of Congruent Triangles

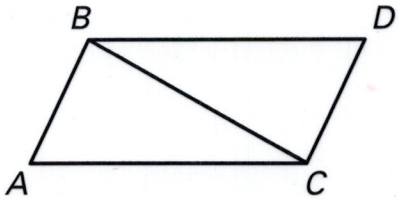
24. *Sample:*



25. length, width, and depth

26. Vertical Angles Congruence Theorem; $\angle ABC \cong \angle EDC$; Definition of congruent figures

27. Yes; alternate interior angles are congruent.



28. Statements (Reasons)

1. $\angle A \cong \angle D$, $\angle B \cong \angle E$ (Given)

2. $m\angle A + m\angle B + m\angle C = 180°$; $m\angle D + m\angle E + m\angle F = 180°$ (Triangle Sum Theorem)

3. $m\angle A + m\angle B + m\angle C = m\angle D + m\angle E + m\angle F$ (Transitive Property of Equality)

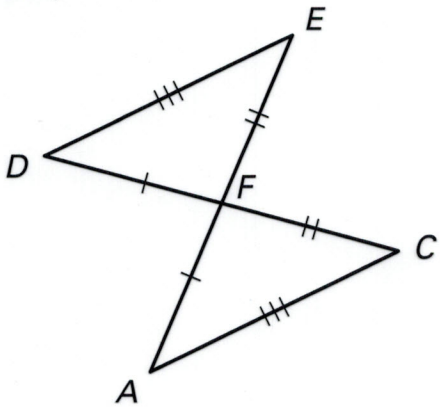
4. $m\angle A = m\angle D$, $m\angle B = m\angle E$ (Definition of congruent angles)

5. $m\angle D + m\angle E + m\angle C = m\angle D + m\angle E + m\angle F$ (Substitution Property of Equality)

6. $m\angle C = m\angle F$ (Subtraction Property of Equality)

7. $\angle C \cong \angle F$ (Definition of congruent angles)

29. No;



30. Measure two angles of the triangle and use the Triangle Sum Theorem to find the third angle. The angles in the quadrilateral can be found using the angle measures of the triangle.

31. a. Corresponding parts of congruent figures are congruent.

b. They are supplementary to two congruent angles and therefore are congruent.

c. *Sample answer:* All right angles are congruent.

d. Yes; all corresponding parts of both triangles are congruent.

32. Statements (Reasons)

1. $\overline{WX} \perp \overrightarrow{VZ}$ at Y, Y is the midpoint of $\overline{WX}$, $\overline{VW} \cong \overline{VX}$, $\overrightarrow{VZ}$ bisects $\angle WVX$ (Given)
2. $\angle WYV$ and $\angle XYV$ are right angles. (Definition of perpendicular lines)
3. $\angle WYV \cong \angle XYV$ (Right Angle Congruence Theorem)
4. $\angle WVY \cong \angle XVY$ (Definition of angle bisector)
5. $\angle YXV \cong \angle YWV$ (Third Angle Theorem)
6. $\overline{WY} \cong \overline{XY}$ (Definition of midpoint)
7. $\overline{VY} \cong \overline{VY}$ (Reflexive Property of Equality)
8. $\triangle VWY \cong \triangle VXY$ (Definition of triangle congruence)

4.2 Mixed Review

33. 4.2

34. 5.8

35. 5.1

36. $\overline{AB} \cong \overline{CB}$

37. $\overline{LM} \cong \overline{NM}$

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

39. If three points lie in the same plane, then the three points are coplanar.

40. If it is raining outside, then the sky is cloudy.