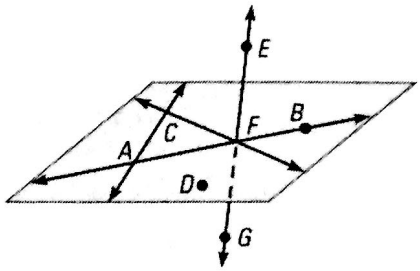
Extra Practice

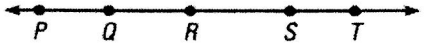
Chapter 1

1.1 In Exercises 1–5, use the diagram.



1. Name three points that are collinear. Then give a name for the line that contains the points.
2. Name the intersection of plane ABC and $\overleftrightarrow{EG}$.
3. Name two pairs of opposite rays.
4. Are points A, C, and G coplanar? *Explain.*
5. Name a line that intersects plane AFD at more than one point.

1.2 In the diagram, P, Q, R, S, and T are collinear, $PT = 54$, $QT = 42$, $QS = 31$, and $RS = 17$. Find the indicated length.



6. PQ
7. PS
8. QR
9. PR
10. ST
11. RT

1.2 Point B is between A and C on $\overline{AC}$. Use the given information to write an equation in terms of x. Solve the equation. Then find AB and BC, and determine whether $\overline{AB}$ and $\overline{BC}$ are congruent.

12. $AB = x + 3$, $BC = 2x + 1$, $AC = 10$
13. $AB = 3x - 7$, $BC = 3x - 1$, $AC = 16$
14. $AB = 11x - 16$, $BC = 8x - 1$, $AC = 78$
15. $AB = 4x - 5$, $BC = 2x - 7$, $AC = 54$
16. $AB = 14x + 5$, $BC = 10x + 15$, $AC = 80$
17. $AB = 3x - 7$, $BC = 2x + 5$, $AC = 108$

1.3 Find the coordinates of the midpoint of the segment with the given endpoints.

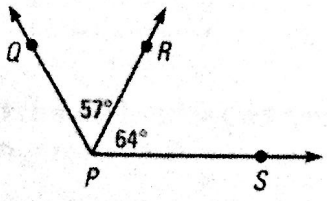
18. $A(2, -4)$, $B(7, 1)$
19. $C(-3, -2)$, $D(-8, 4)$
20. $E(-2.3, -1.9)$, $F(3.1, -9.7)$
21. $G(3, -7)$, $H(-1, 9)$
22. $I(4, 3)$, $J(2, 2)$
23. $K(1.7, -7.9)$, $L(8.5, -8.2)$

1.3 Find the length of the segment with given endpoint and midpoint M.

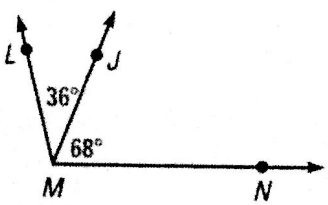
24. $Z(0, 1)$ and $M(7, 1)$
25. $Y(4, 3)$ and $M(1, 7)$
26. $X(0, -1)$ and $M(12, 4)$
27. $W(5, 3)$ and $M(-10, -5)$
28. $V(-3, -4)$ and $M(9, 5)$
29. $U(3, 2)$ and $M(11, -4)$

1.4 Use the given information to find the indicated angle measure.

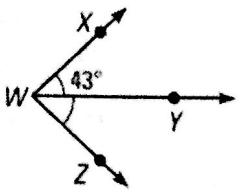
30. $m\angle QPS = \_?\_$



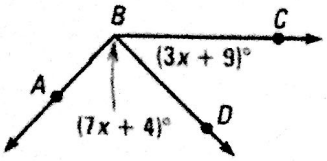
31. $m\angle LMN = \_?\_$



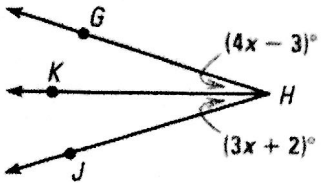
32. $m\angle XWZ = \_?\_$



1.4 **33.** Given $m\angle ABC = 133°$, find $m\angle ABD$.

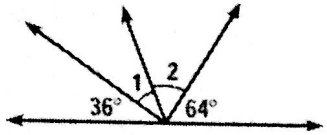


34. Given $m\angle GHK = 17°$, find $m\angle KHJ$.



1.5 **Tell whether $\angle 1$ and $\angle 2$ are *vertical angles*, *adjacent angles*, a *linear pair*, *complementary*, or *supplementary*. There may be more than one answer.**

35.



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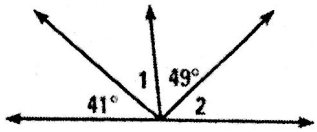

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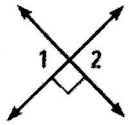
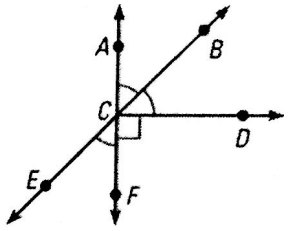


1.5 **Use the diagram.**

38. Name two supplementary angles that are not a linear pair.

39. Name two vertical angles that are not complementary.

40. Name three pairs of complementary angles. Tell whether each pair contains vertical angles, adjacent angles, or neither.



1.6 **Tell whether the figure is a polygon. If it is not, *explain* why. If it is, tell whether it is *convex* or *concave*.**

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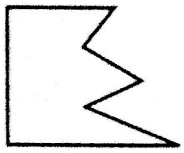

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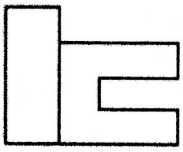

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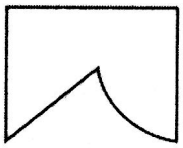

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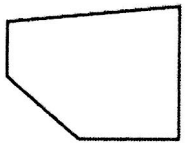
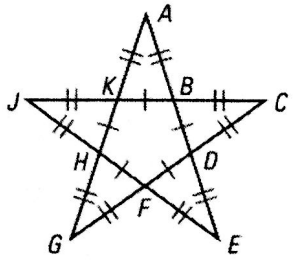


1.6 **In Exercises 45 and 46, use the diagram.**

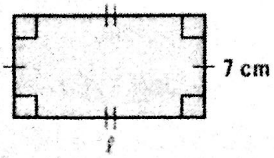
45. Identify two different equilateral polygons in the diagram. Classify each by the number of sides.

46. Name one of each of the following figures as it appears in the five-pointed star diagram: triangle, quadrilateral, pentagon, hexagon, heptagon.

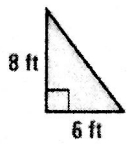


1.7 **Use the information about the figure to find the indicated measure.**

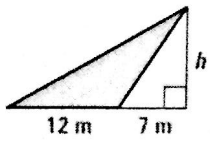
47. Area = 91 cm^2
Find the length ℓ.



48. Find the area of the triangle.



49. Area = 66 m^2
Find the height h.



1.7 **Find the perimeter and area of the triangle with the given vertices. Round to the nearest tenth.**

50. $A(2, 1)$, $B(3, 6)$, $C(6, 1)$

51. $D(1, 1)$, $E(3, 1)$, $F(6, 5)$

EXTRA PRACTICE

Chapter 2

2.1 ***Describe*** **the pattern in the numbers. Write the next number in the pattern.**

1. 17, 23, 15, 21, 13, 19,...
2. 1, 0.5, 0.25, 0.125, 0.0625,...
3. 2, 3, 5, 7, 11, 13,...
4. 7.0, 7.5, 8.0, 8.5,...
5. $1, \frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \ldots$
6. 2, 2, 4, 6, 10, 16, 26,...

2.1 Show the conjecture is false by finding a counterexample.

7. The difference of any two numbers is a value that lies between those two numbers.
8. The value of $2x$ is always greater than the value of x.
9. If an angle A can be bisected, then angle A must be obtuse.

2.2 For the given statement, write the if-then form, the converse, the inverse, and the contrapositive.

10. Two lines that intersect form two pairs of vertical angles.
11. All squares are four-sided regular polygons.

2.2 Decide whether the statement is *true* or *false*. If false, provide a counterexample.

12. If a figure is a hexagon, then it is a regular polygon.
13. If two angles are complementary, then the sum of their measures is 90°.

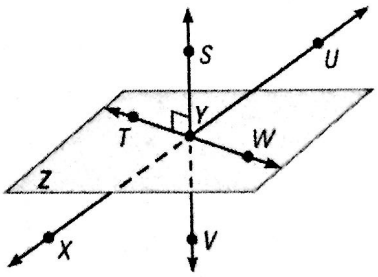
2.3 Write the statement that follows from the pair of statements that are given.

14. If a triangle is equilateral, then it has congruent angles.
    If a triangle has congruent angles, then it is regular.
15. If two coplanar lines are not parallel, then they intersect.
    If two lines intersect, then they form congruent vertical angles.

2.3 Select the word(s) that make(s) the conclusion true.

16. John only does his math homework when he is in study hall. John is doing his math homework. So, John (*is*, *may be*, *is not*) in study hall.
17. May sometimes buys pretzels when she goes to the supermarket. May is at the supermarket. So, she (*will*, *might*, *will not*) buy pretzels.

2.4 Use the diagram to determine if the statement is *true* or *false*.



18. $\overleftrightarrow{SV} \perp$ plane Z
19. $\overleftrightarrow{XU}$ intersects plane Z at point Y.
20. $\overleftrightarrow{TW}$ lies in plane Z.
21. $\angle SYT$ and $\angle WYS$ are vertical angles.
22. $\angle SYT$ and $\angle TYV$ are complementary angles.
23. $\angle TYU$ and $\angle UYW$ are a linear pair.
24. $\angle UYV$ is acute.

EXTRA PRACTICE

2.5 **Solve the equation. Write a reason for each step.**

25. $4x + 15 = 39$

26. $6x + 47 = 10x - 9$

27. $2(-7x + 3) = -50$

28. $54 + 9x = 3(7x + 6)$

29. $13(2x - 3) - 20x = 3$

30. $31 + 25x = 7x - 14 + 3x$

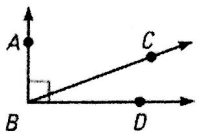
2.6 **Copy and complete the statement. Name the property illustrated.**

31. If $m\angle JKL = m\angle GHI$ and $m\angle GHI = m\angle ABC$, then $\_?\_ = \_?\_$.

32. If $m\angle MNO = m\angle PQR$, then $m\angle PQR = \_?\_$

33. $m\angle XYZ = \_?\_$

2.6 **34.** Copy and complete the proof.



GIVEN ▶ Point C is in the interior of $\angle ABD$. $\angle ABD$ is a right angle.

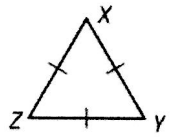
PROVE ▶ $\angle ABC$ and $\angle CBD$ are complementary.

STATEMENTS	REASONS
1. $\angle ABD$ is a right angle.	1. Given
2. $m\angle ABD = 90°$	2. ?
3. ?	3. Given
4. $m\angle ABD = m\angle ABC + m\angle CBD$	4. ?
5. ? $= m\angle ABC + m\angle CBD$	5. Substitution Property of Equality
6. ?	6. Definition of complementary angles

2.6 **35.** Use the given information and the diagram to prove the statement.

GIVEN ▶ $\overline{XY} \cong \overline{YZ} \cong \overline{ZX}$

PROVE ▶ The perimeter of $\triangle XYZ$ is $3 \cdot XY$.



2.7 **Copy and complete the statement. $\angle AGD$ is a right angle and $\overleftrightarrow{AB}$, $\overleftrightarrow{CD}$, and $\overleftrightarrow{EF}$ intersect at point G.**

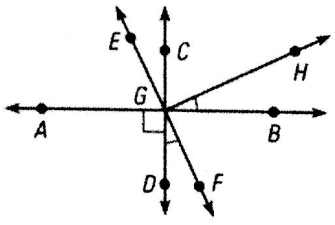
36. If $m\angle CGF = 158°$, then $m\angle EGD = \_?\_$.

37. If $m\angle EGA = 67°$, then $m\angle FGD = \_?\_$.

38. If $m\angle FGC = 149°$, then $m\angle EGA = \_?\_$.

39. $m\angle DGB = \_?\_$

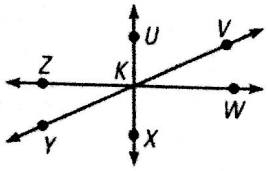
40. $m\angle FGH = \_?\_$



2.7 **41.** Write a two-column proof.

GIVEN ▶ $\angle UKV$ and $\angle VKW$ are complements.

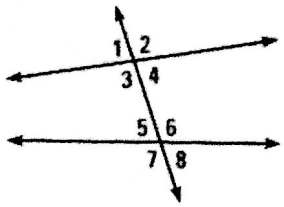
PROVE ▶ $\angle YKZ$ and $\angle XKY$ are complements.



EXTRA PRACTICE

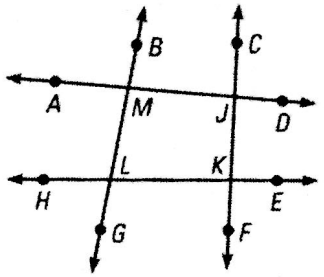
Chapter 3

3.1 Classify the angle pair as *corresponding*, *alternate interior*, *alternate exterior*, or *consecutive interior* angles.



1. $\angle 6$ and $\angle 2$
2. $\angle 7$ and $\angle 2$
3. $\angle 5$ and $\angle 3$
4. $\angle 4$ and $\angle 5$
5. $\angle 1$ and $\angle 5$
6. $\angle 3$ and $\angle 6$

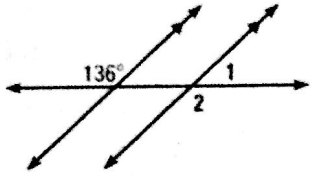
3.1 Copy and complete the statement. List all possible correct answers.



7. $\angle AMB$ and ? are corresponding angles.
8. $\angle AML$ and ? are alternate interior angles.
9. $\angle CJD$ and ? are alternate exterior angles.
10. $\angle LMJ$ and ? are consecutive interior angles.
11. ? is a transversal of $\overleftrightarrow{AD}$ and $\overleftrightarrow{HE}$.

3.2 Find $m\angle 1$ and $m\angle 2$. *Explain* your reasoning.

12.



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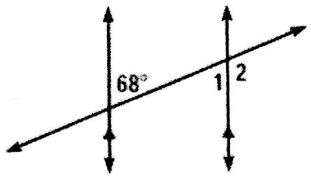

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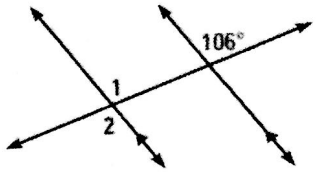
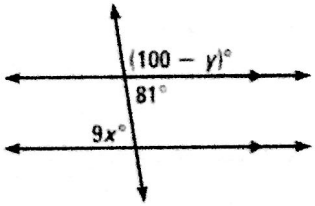


3.2 Find the values of x and y.

15.



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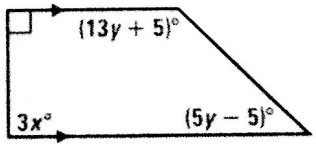

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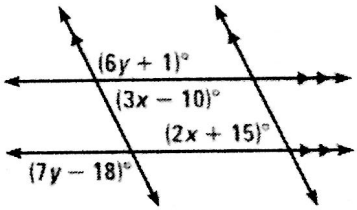

3.3 Is there enough information to prove $m \parallel n$? If so, state the postulate or theorem you would use.

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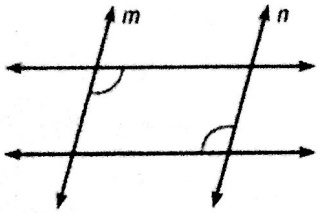

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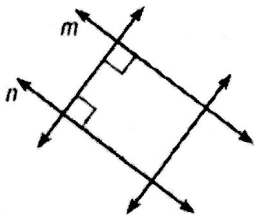

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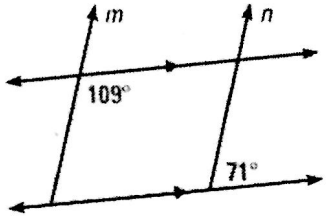
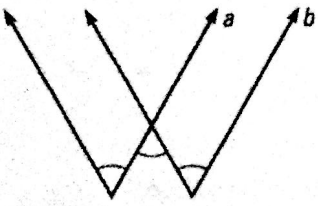


3.3 Can you prove that lines a and b are parallel? If so, *explain* how.

21.



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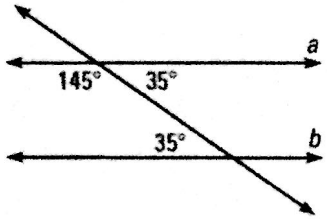

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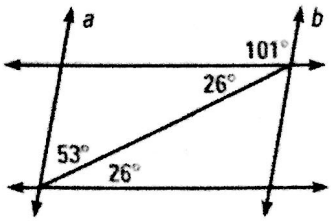


EXTRA PRACTICE

3.4 Tell whether the lines through the given points are *parallel, perpendicular,* or *neither. Justify* your answer.

24. Line 1: (7, 4), (10, 5)
Line 2: (2, 3), (8, 5)

25. Line 1: (−3, 1), (−2, 5)
Line 2: (−1, −3), (5, −2)

26. Line 1: (−6, 0), (8, 7)
Line 2: (1, 4), (2, 2)

3.4 Tell which line through the given points is steeper.

27. Line 1: (0, −6), (−4, −9)
Line 2: (−2, 5), (1, 9)

28. Line 1: (−1, −5), (−1, 3)
Line 2: (−3, 4), (−5, 4)

29. Line 1: (1, 1), (2, 6)
Line 2: (1, 1), (3, 10)

3.5 Write an equation of the line that passes through the given point P and has the given slope m.

30. $P(4, 7)$, $m = 2$

31. $P(-3, 0)$, $m = \frac{2}{3}$

32. $P(9, 4)$, $m = -\frac{1}{3}$

3.5 Write an equation of the line that passes through point P and is parallel to the line with the given equation.

33. $P(1, -2)$, $y = -2x - 6$

34. $P(6, 3)$, $y = -\frac{1}{3}x + 12$

35. $P(-7, 3)$, $y = x + 3$

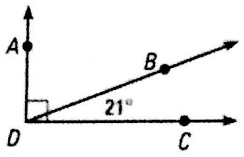
36. $P(0, 3)$, $y = 4x - 2$

37. $P(-9, 4)$, $y = \frac{2}{5}x + 1$

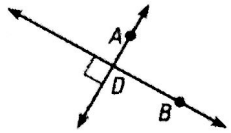
38. $P(8, -3)$, $y = x - 5$

3.6 Find $m\angle ADB$.

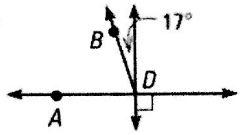
39.



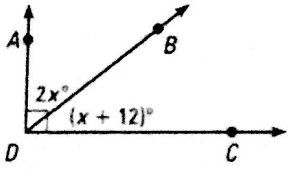
40.



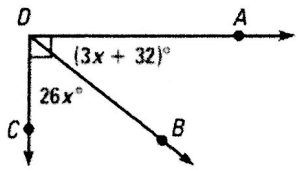
41.



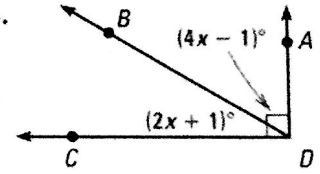
42.



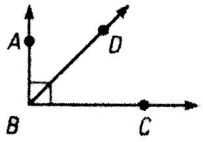
43.



44.



3.6 45. Copy and complete the proof.



GIVEN ▶ $\overrightarrow{BA} \perp \overrightarrow{BC}$, $\overrightarrow{BD}$ bisects $\angle ABC$.

PROVE ▶ $m\angle ABD = 45°$

STATEMENTS	REASONS
1. $\overrightarrow{BA} \perp \overrightarrow{BC}$	1. ?
2. ?	2. Definition of perpendicular lines
3. $m\angle ABC = 90°$	3. ?
4. ?	4. Given
5. $m\angle ABD = m\angle DBC$	5. ?
6. $m\angle ABC =$? + ?	6. Angle Addition Postulate
7. $m\angle ABD + m\angle DBC = 90°$	7. ?
8. $m\angle ABD +$? $= 90°$	8. Substitution Property of Equality
9. $2(m\angle ABD) = 90°$	9. ?
10. $m\angle ABD = 45°$	10. ?

EXTRA PRACTICE

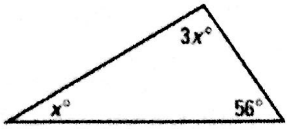
EXTRA PRACTICE

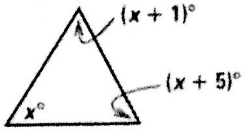
Chapter 4

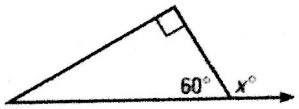
4.1 **A triangle has the given vertices. Graph the triangle and classify it by its sides. Then determine if it is a right triangle.**

1. $A(-1, -2), B(-1, 2), C(4, 2)$
2. $A(-1, -1), B(3, 1), C(2, -2)$
3. $A(-3, 4), B(2, 4), C(5, -2)$

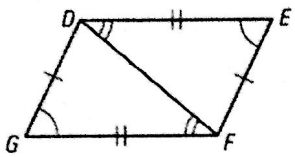
4.1 **Find the value of x. Then classify the triangle by its angles.**

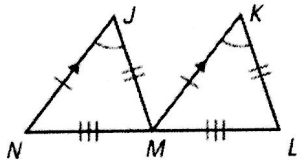
4. 

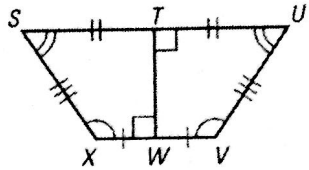
5. 

6. 

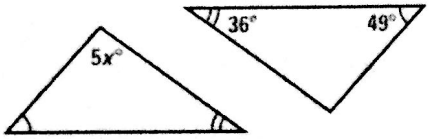
4.2 **Write a congruence statement for any figures that can be proved congruent. *Explain* your reasoning.**

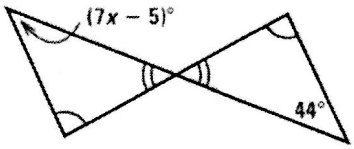
7. 

8. 

9. 

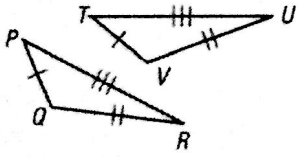
4.2 **Find the value of x.**

10. 

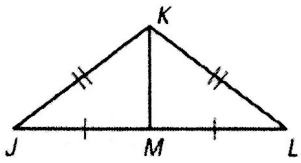
11. 

4.3 **Decide whether the congruence statement is true. *Explain* your reasoning.**

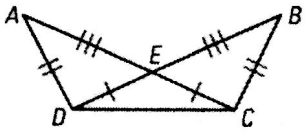
12. $\triangle PQR \cong \triangle TUV$



13. $\triangle JKM \cong \triangle LMK$



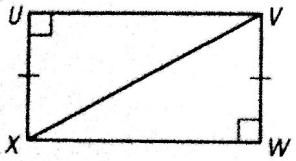
14. $\triangle ACD \cong \triangle BDC$

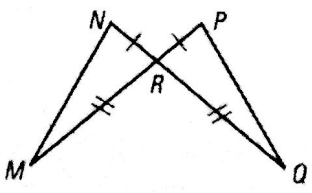


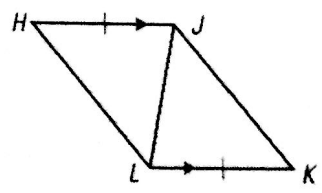
4.3 **Use the given coordinates to determine if $\triangle ABC \cong \triangle PQR$.**

15. $A(-2, 1), B(2, 6), C(6, 2), P(-1, -2), Q(3, 3), R(7, -1)$
16. $A(-4, 5), B(2, 6), C(-2, 3), P(2, 1), Q(8, 2), R(5, -1)$

4.4 **Name the congruent triangles in the diagram. *Explain*.**

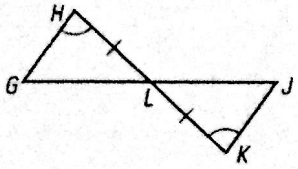
17. 

18. 

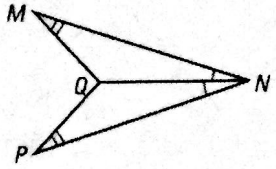
19. 

4.5 Is it possible to prove that the triangles are congruent? If so, state the postulate or theorem you would use.

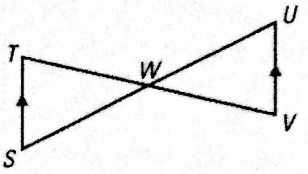
20. $\triangle GHL$, $\triangle JKL$



21. $\triangle MNQ$, $\triangle PNQ$



22. $\triangle STW$, $\triangle UVW$



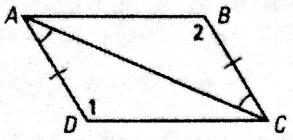
4.5 Tell whether you can use the given information to determine whether $\triangle ABC \cong \triangle DEF$. *Explain* your reasoning.

23. $\angle A \cong \angle D$, $\overline{AB} \cong \overline{DE}$, $\angle B \cong \angle E$

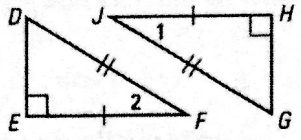
24. $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\angle A \cong \angle D$

4.6 Use the information in the diagram to write a plan for proving that $\angle 1 \cong \angle 2$.

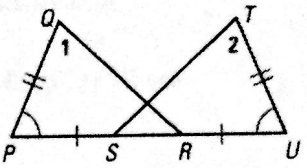
25.



26.



27.



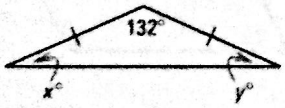
4.6 Use the vertices of $\triangle ABC$ and $\triangle DEF$ to show that $\angle A \cong \angle D$. *Explain.*

28. $A(0, 8)$, $B(6, 0)$, $C(0, 0)$, $D(3, 10)$, $E(9, 2)$, $F(3, 2)$

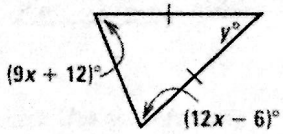
29. $A(-3, -2)$, $B(-2, 3)$, $C(2, 2)$, $D(5, 1)$, $E(6, 6)$, $F(10, 5)$

4.7 Find the value(s) of the variable(s).

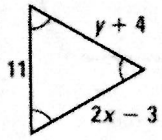
30.



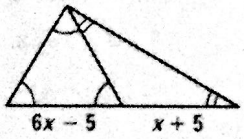
31.



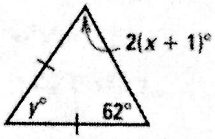
32.



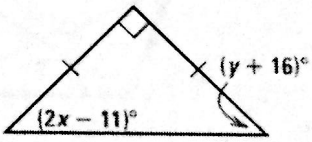
33.



34.



35.

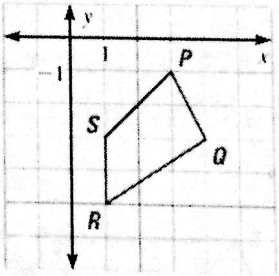


4.8 Copy the figure and draw its image after the transformation.

36. Reflection: in the y-axis

37. Reflection: in the x-axis

38. Translation: $(x, y) \rightarrow (x - 3, y + 7)$



4.8 Use the coordinates to graph $\overline{AB}$ and $\overline{CD}$. Tell whether $\overline{CD}$ is a rotation of $\overline{AB}$ about the origin. If so, give the angle and direction of rotation.

39. $A(4, 2)$, $B(1, 1)$, $C(-4, -2)$, $D(-1, -1)$

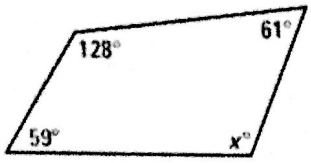
40. $A(-1, 3)$, $B(0, 2)$, $C(-1, 2)$, $D(-3, 1)$

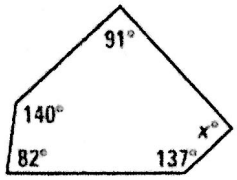
EXTRA PRACTICE

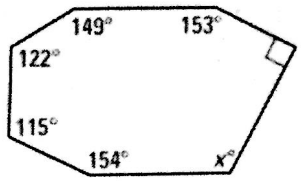
Chapter 8

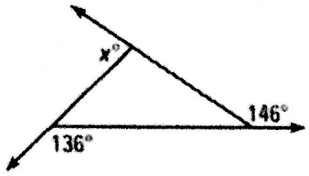
EXTRA PRACTICE

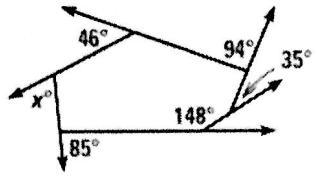
8.1 Find the value of x.

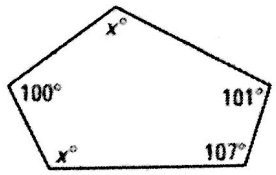
1. 

2. 

3. 

4. 

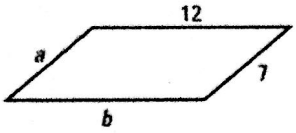
5. 

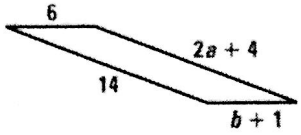
6. 

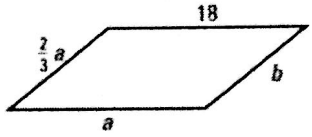
8.1 Find the measure of an interior angle and an exterior angle of the indicated regular polygon.

7. Regular hexagon
8. Regular 9-gon
9. Regular 17-gon

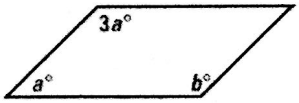
8.2 Find the value of each variable in the parallelogram.

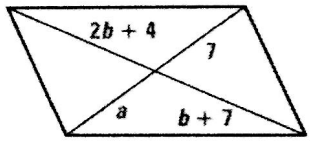
10. 

11. 

12. 

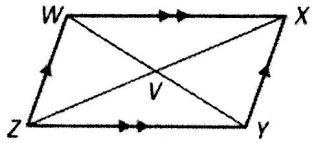
13. 

14. 

15. 

8.2 Use the diagram to copy and complete the statement.

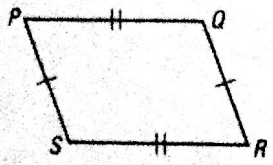
16. $\angle WXV \cong$?
17. $\angle ZWV \cong$?
18. $\angle WVX \cong$?
19. $WV =$?
20. $WZ =$?
21. $2 \cdot ZV =$?

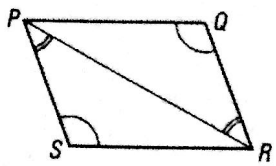


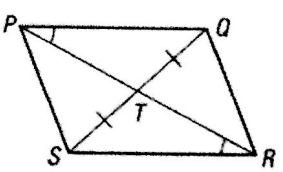
8.3 The vertices of quadrilateral $ABCD$ are given. Draw $ABCD$ in a coordinate plane and show that it is a parallelogram.

22. $A(5, 6)$, $B(7, 3)$, $C(5, -2)$, $D(3, 1)$
23. $A(-8, 2)$, $B(-6, 3)$, $C(-1, 2)$, $D(-3, 1)$
24. $A(-1, 11)$, $B(2, 14)$, $C(6, 11)$, $D(3, 8)$
25. $A(-1, -5)$, $B(4, -4)$, $C(6, -9)$, $D(1, -10)$

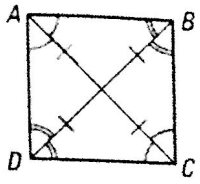
8.3 *Describe* how to prove that quadrilateral $PQRS$ is a parallelogram.

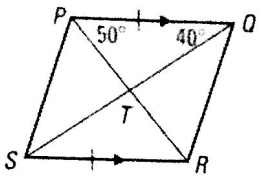
26. 

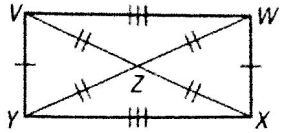
27. 

28. 

8.4 Classify the special quadrilateral. *Explain* your reasoning.

29. 

30. 

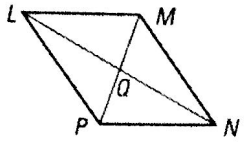
31. 

8.4 The diagonals of rhombus $LMNP$ intersect at Q. Given that $LM = 5$ and $m\angle QLM = 30°$, find the indicated measure.

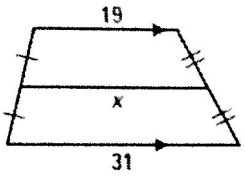
32. $m\angle LMQ$

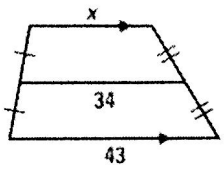
33. $m\angle LQM$

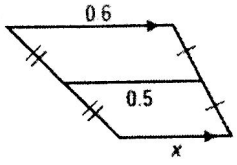
34. MN



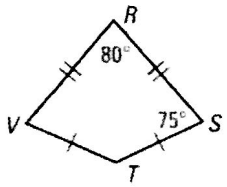
8.5 Find the value of x.

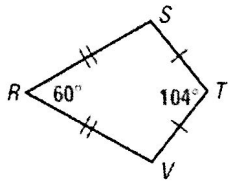
35. 

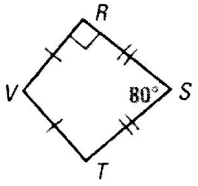
36. 

37. 

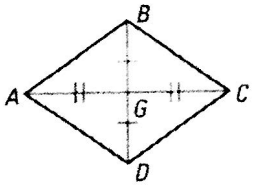
8.5 $RSTV$ is a kite. Find $m\angle V$.

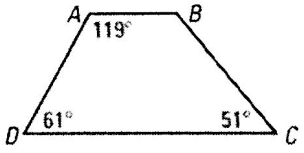
38. 

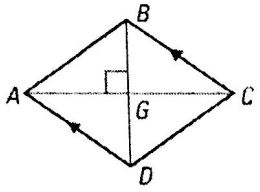
39. 

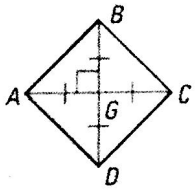
40. 

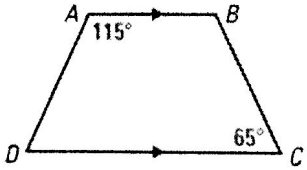
8.6 Give the most specific name for the quadrilateral. *Explain* your reasoning.

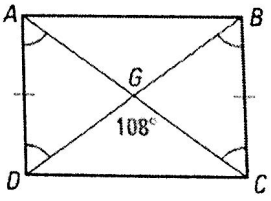
41. 

42. 

43. 

44. 

45. 

46. 

8.6 The vertices of quadrilateral $DEFG$ are given. Give the most specific name for $DEFG$. *Justify* your answer.

47. $D(6, 8)$, $E(9, 12)$, $F(12, 8)$, $G(9, 6)$

48. $D(1, 2)$, $E(4, 1)$, $F(3, -2)$, $G(0, -1)$

49. $D(10, 3)$, $E(14, 4)$, $F(20, 2)$, $G(12, 0)$

50. $D(-2, 10)$, $E(1, 13)$, $F(5, 13)$, $G(-2, 6)$

EXTRA PRACTICE