Name _____ Date _____

LESSON 8.1

# Practice

*For use with pages 526–533*

**Find the sum of the measures of the interior angles of the indicated convex polygon.**

**1.** Hexagon **2.** Dodecagon **3.** 11-gon

**4.** 15-gon **5.** 20-gon **6.** 40-gon

**The sum of the measures of the interior angles of a convex polygon is given. Classify the polygon by the number of sides.**

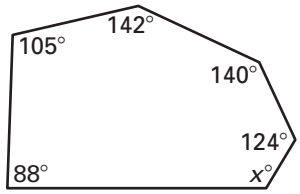
**7.** 180° **8.** 540° **9.** 900°

**10.** 1800° **11.** 2520° **12.** 3960°

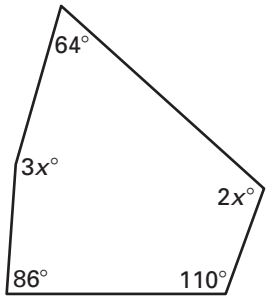
**13.** 5040° **14.** 5940° **15.** 8640°

**Find the value of *x*.**

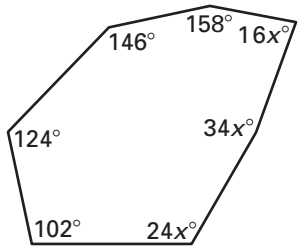
**16.**



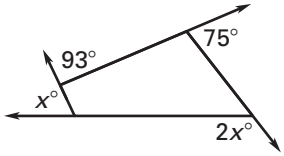

**17.**



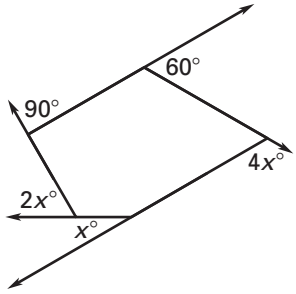

**18.**



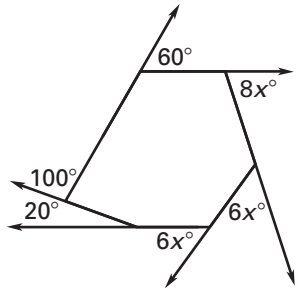

**19.**




**20.**




**21.**




**22.** What is the measure of each exterior angle of a regular nonagon?

**23.** The measures of the exterior angles of a convex quadrilateral are 90°, 10*x*°, 5*x*°, and 45°. What is the measure of the largest exterior angle?

**24.** The measures of the interior angles of a convex octagon are 45*x*°, 40*x*°, 155°, 120°, 155°, 38*x*°, 158°, and 41*x*°. What is the measure of the smallest interior angle?

**Find the measures of an interior angle and an exterior angle of the indicated polygon.**

**25.** Regular triangle **26.** Regular octagon **27.** Regular 16-gon

**28.** Regular 45-gon **29.** Regular 60-gon **30.** Regular 100-gon

Name _____ Date _____

LESSON 8.1

# Practice *continued*

*For use with pages 526–533*

**In Exercises 31–34, find the value of *n* for each regular *n*-gon described.**

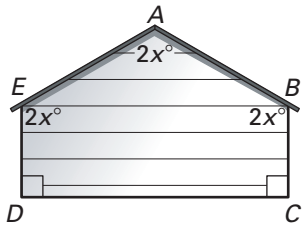
**31.** Each interior angle of the regular $n$-gon has a measure of 140°.

**32.** Each interior angle of the regular $n$-gon has a measure of 175.2°.

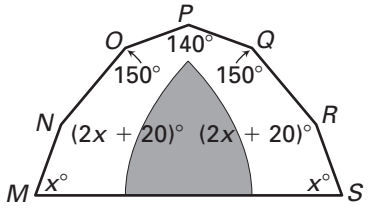
**33.** Each exterior angle of the regular $n$-gon has a measure of 45°.

**34.** Each exterior angle of the regular $n$-gon has a measure of 3°.

**35.** **Storage Shed** The side view of a storage shed is shown below. Find the value of $x$. Then determine the measure of each angle.




**36.** **Tents** The front view of a camping tent is shown below. Find the value of $x$. Then determine the measure of each angle.




**37.** **Proof** Because all the interior angle measures of a regular $n$-gon are congruent, you can find the measure of each individual interior angle. The measure of each interior angle of a regular $n$-gon is $\frac{(n-2) \cdot 180}{n}$. Write a paragraph proof to prove this statement.

Name _____ Date _____

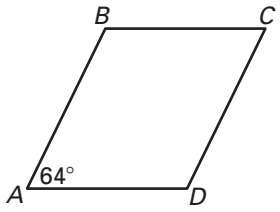
LESSON 8.2

# Practice

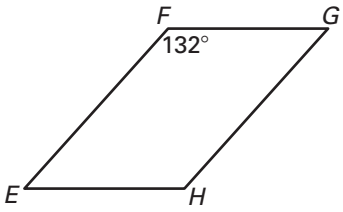
*For use with pages 535–541*

**Find the measure of the indicated angle in the parallelogram.**

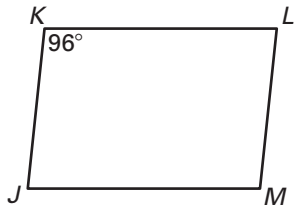
**1.** Find $m\angle B$.




**2.** Find $m\angle G$.

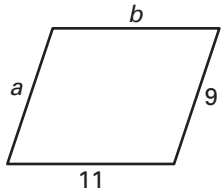



**3.** Find $m\angle M$.

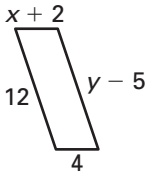



**Find the value of each variable in the parallelogram.**

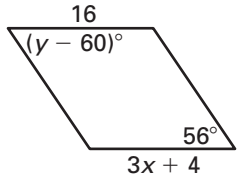
**4.**



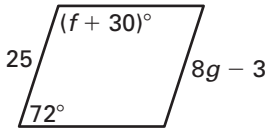

**5.**



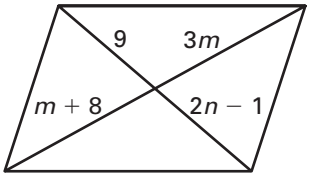

**6.**



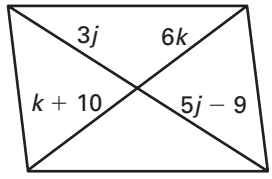

**7.**



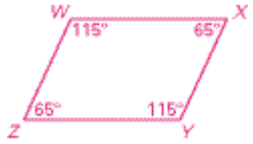

**8.**




**9.**




**10.** In $\square WXYZ$, $m\angle W$ is 50 degrees more than $m\angle X$. Sketch $\square WXYZ$. Find the measure of each interior angle. Then label each angle with its measure.




**11.** In $\square EFGH$, $m\angle G$ is 25 degrees less than $m\angle H$. Sketch $\square EFGH$. Find the measure of each interior angle. Then label each angle with its measure.


**Find the indicated measure in $\square ABCD$.**

**12.** $m\angle AEB$

**13.** $m\angle BAE$

**14.** $m\angle AED$

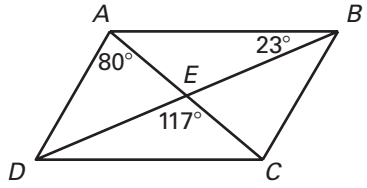
**15.** $m\angle ECB$

**16.** $m\angle BAD$

**17.** $m\angle DCE$

**18.** $m\angle ADC$

**19.** $m\angle DCB$



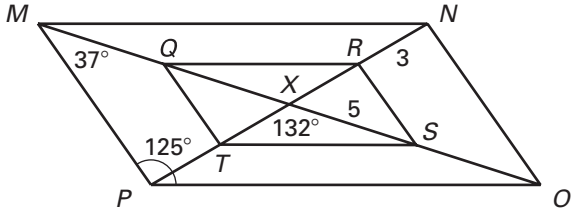
Name _____ Date _____

LESSON 8.2

# Practice *continued*

*For use with pages 535–541*

**Use the diagram of $\square MNOP$. Points $Q$, $R$, $S$, and $T$ are midpoints of $\overline{MX}$, $\overline{NX}$, $\overline{OX}$, and $\overline{PX}$. Find the indicated measure.**




**20.** $PN$

**21.** $MQ$

**22.** $XO$

**23.** $m\angle NMQ$

**24.** $m\angle NXO$

**25.** $m\angle MNP$

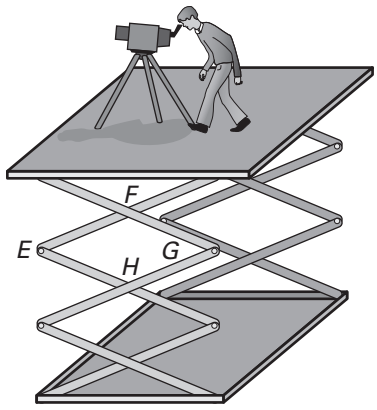
**26.** $m\angle NPO$

**27.** $m\angle NOP$

**28.** **Movie Equipment** The scissor lift shown at the right is sometimes used by camera crews to film movie scenes. The lift can be raised or lowered so that the camera can get a variety of views of one scene. In the figure, points $E$, $F$, $G$, and $H$ are the vertices of a parallelogram.

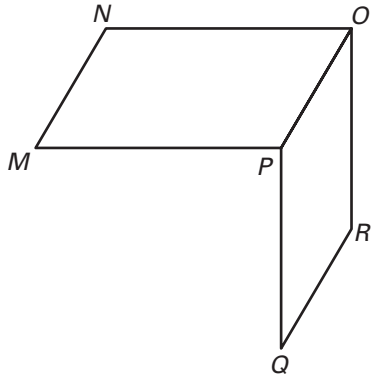
**a.** If $m\angle E = 45°$, find $m\angle F$.

**b.** What happens to $\angle E$ and $\angle F$ when the lift is raised? *Explain*.




**29.** In parallelogram $RSTU$, the ratio of $RS$ to $ST$ is 5 : 3. Find $RS$ if the perimeter of $\square RSTU$ is 64.

**30.** Parallelogram $MNOP$ and parallelogram $PQRO$ share a common side, as shown. Using a two-column proof, prove that segment $MN$ is congruent to segment $QR$.




**GIVEN:** $MNOP$ and $PQRO$ are parallelograms.

**PROVE:** $\overline{MN} \cong \overline{QR}$

Name _____ Date _____

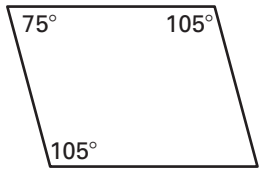
LESSON 8.3

# Practice

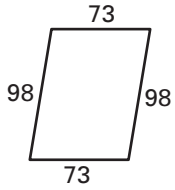
*For use with pages 542–549*

**What theorem can you use to show that the quadrilateral is a parallelogram?**

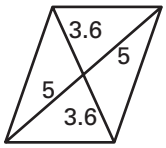
**1.**



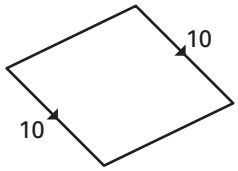

**2.**




**3.**

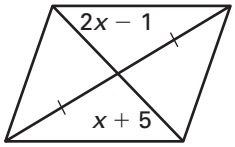



**4.**

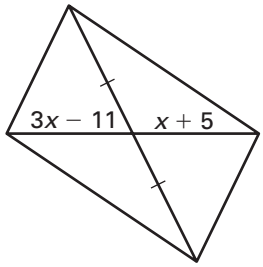



**For what value of *x* is the quadrilateral a parallelogram?**

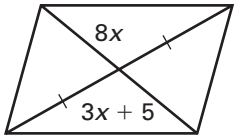
**5.**



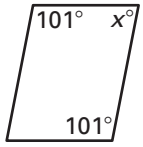

**6.**



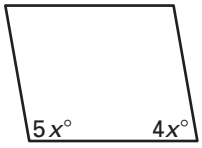

**7.**



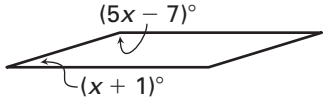

**8.**




**9.**




**10.**



Name _____ Date _____

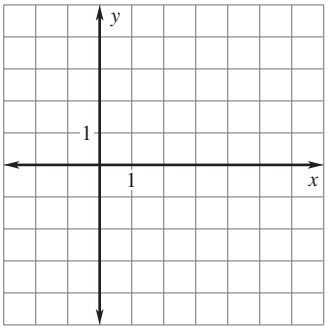
LESSON 8.3

# Practice *continued*

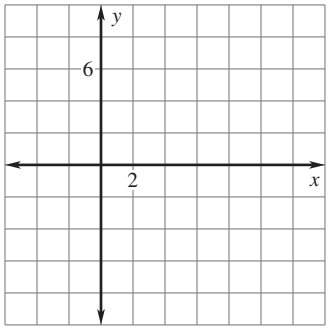
*For use with pages 542–549*

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

**11.** $A(-2, -3)$, $B(0, 4)$, $C(6, 4)$, $D(4, -3)$

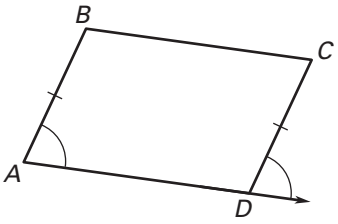



**12.** $A(-3, -4)$, $B(-1, 2)$, $C(7, 0)$, $D(5, -6)$

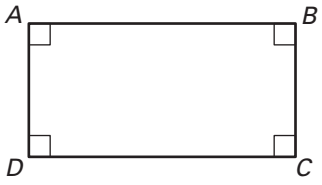



***Describe* how to prove that *ABCD* is a parallelogram.**

**13.**

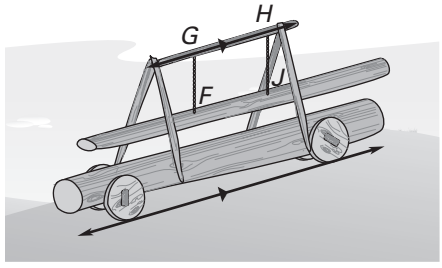



**14.**




**15.** Three vertices of $\square ABCD$ are $A(-1, 4)$, $B(4, 4)$, and $C(11, -3)$. Find the coordinates of point $D$.

**16.** **History** The diagram shows a battering ram which was used in ancient times to break through walls. A log is suspended on ropes of equal length ($\overline{GF}$ and $\overline{HJ}$). The log swings, causing quadrilateral *FGHJ* to shift. In the diagram, $\overline{GH} \cong \overline{FJ}$ and $\overline{GH}$ is parallel to the ground.



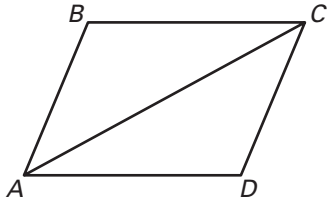

**a.** Identify *FGHJ*. *Explain*.

**b.** *Explain* why the log is always parallel to the ground.

**17.** **Proof** Use the diagram at the right.

**GIVEN:** $\triangle ABC \cong \triangle CDA$

**PROVE:** *ABCD* is a parallelogram.



Name _____ Date _____

LESSON 8.4

# Practice

*For use with pages 553–560*

**For any rhombus *ABCD*, decide whether the statement is *always* or *sometimes* true. Draw a diagram and *explain* your reasoning.**

**1.** $\angle ABC \cong \angle CDA$

**2.** $\overline{CA} \cong \overline{DB}$

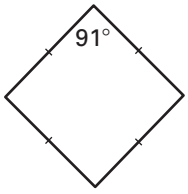
**For any rectangle *FGHJ*, decide whether the statement is *always* or *sometimes* true. Draw a diagram and *explain* your reasoning.**

**3.** $\angle F \cong \angle H$

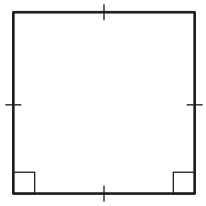
**4.** $\overline{GH} \cong \overline{HJ}$

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

**5.**




**6.**



**Name each quadrilateral—*parallelogram*, *rectangle*, *rhombus*, and *square*—for which the statement is true.**

**7.** It is equilateral.

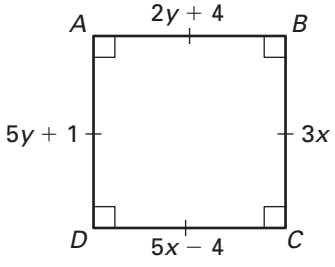
**8.** The diagonals are congruent.

**9.** It can contain obtuse angles.

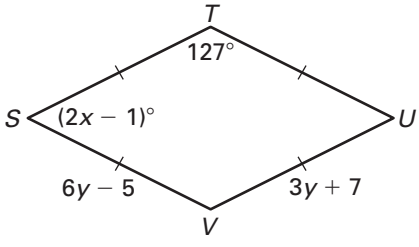
**10.** It contains no acute angles.

**Classify the special quadrilateral. *Explain* your reasoning. Then find the values of *x* and *y*.**

**11.**




**12.**



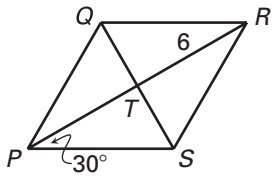
Name _____ Date _____

LESSON 8.4

# Practice *continued*

*For use with pages 553–560*

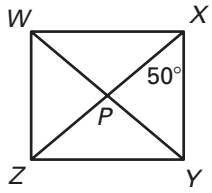
**The diagonals of rhombus *PQRS* intersect at *T*. Given that $m\angle RPS = 30°$ and $RT = 6$, find the indicated measure.**




**13.** $m\angle QPR$ **14.** $m\angle QTP$

**15.** $RP$ **16.** $QT$

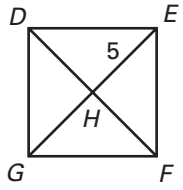
**The diagonals of rectangle *WXYZ* intersect at *P*. Given that $m\angle YXZ = 50°$ and $XZ = 12$, find the indicated measure.**




**17.** $m\angle WXZ$ **18.** $m\angle WPX$

**19.** $PY$ **20.** $WX$

**The diagonals of square *DEFG* intersect at *H*. Given that $EH = 5$, find the indicated measure.**




**21.** $m\angle GHF$ **22.** $m\angle DGH$

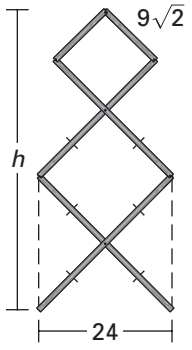
**23.** $HF$ **24.** $DE$

**25. Windows** In preparation for a storm, a window is protected by nailing boards along its diagonals. The lengths of the boards are the same. Can you conclude that the window is square? *Explain*.

**26. Clothing** The side view of a wooden clothes dryer is shown at the right. Measurements shown are in inches.

**a.** The uppermost quadrilateral is a square. Classify the quadrilateral below the square. *Explain* your reasoning.

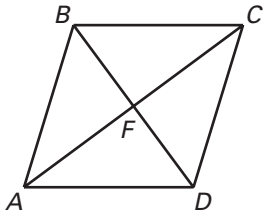
**b.** Find the height $h$ of the clothes dryer.




**27. Proof** The diagonals of rhombus $ABCD$ form several triangles. Using a two-column proof, prove that $\triangle BFA \cong \triangle DFC$.

**GIVEN:** $ABCD$ is a rhombus.

**PROVE:** $\triangle BFA \cong \triangle DFC$



Name _____ Date _____

LESSON 8.5

# Practice

*For use with pages 562–569*

**Points *A, B, C,* and *D* are the vertices of a quadrilateral. Determine whether *ABCD* is a trapezoid.**

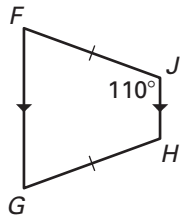
**1.** $A(-2, 3), B(3, 3), C(-1, -2), D(2, -2)$

**2.** $A(-3, 2), B(3, 0), C(4, 3), D(-2, 5)$

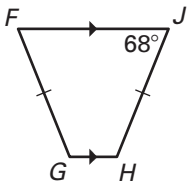
**3.** $A(-5, -3), B(-1, -1), C(-1, 3), D(-3, 2)$

**Find $m\angle F$, $m\angle G$, and $m\angle H$.**

**4.**

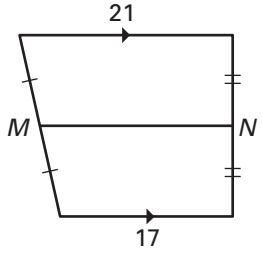



**5.**

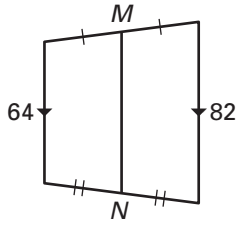



**Find the length of the midsegment of the trapezoid.**

**6.**

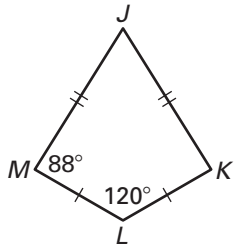



**7.**

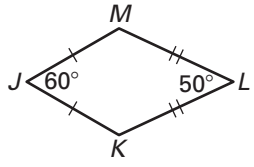



***JKLM* is a kite. Find $m\angle K$.**

**8.**

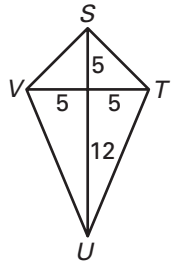



**9.**

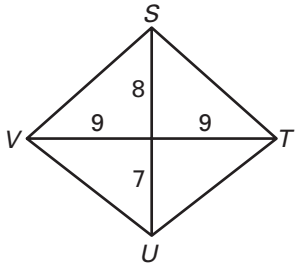



**Use Theorem 8.18 and the Pythagorean Theorem to find the side lengths of the kite. Write the lengths in simplest radical form.**

**10.**




**11.**



Name _____ Date _____

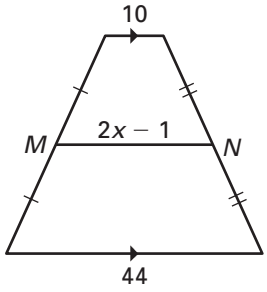
LESSON 8.5

# Practice *continued*

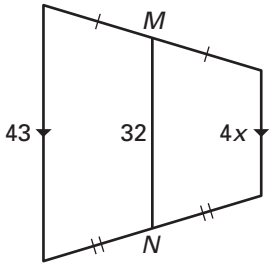
*For use with pages 562–569*

**Find the value of *x*.**

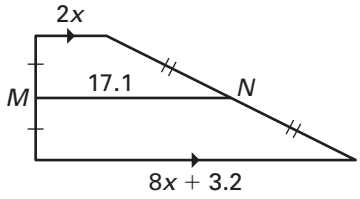
**12.**



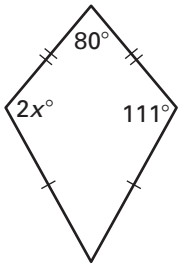

**13.**



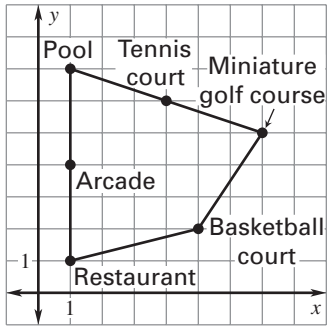

**14.**




**15.**




**16. Maps** Use the map shown at the right. The lines represent a sidewalk connecting the locations on the map.



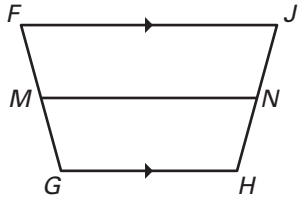

**a.** Is the sidewalk in the shape of a kite? *Explain.*

**b.** A sidewalk is built that connects the arcade, tennis court, miniature golf course, and restaurant. What is the shape of the sidewalk?

**c.** What is the length of the midsegment of the sidewalk in part (b)?

**17. Kite** You cut out a piece of fabric in the shape of a kite so that the congruent angles of the kite are 100°. Of the remaining two angles, one is 4 times larger than the other. What is the measure of the largest angle in the kite?

**18. Proof** $\overline{MN}$ is the midsegment of isosceles trapezoid *FGHJ*. Write a paragraph proof to show that *FMNJ* is an isosceles trapezoid.



Name _____ Date _____

LESSON 8.6

# Practice

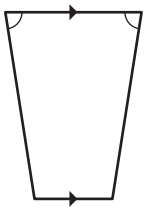
*For use with pages 570–575*

**Complete the chart. Put an X in the box if the shape *always* has the given property.**

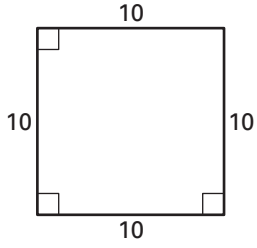
| | Property | ▱ | Rectangle | Rhombus | Square | Kite | Trapezoid |
|---|---|---|---|---|---|---|---|
| **1.** | Both pairs of opposite sides are congruent. | | | | | | |
| **2.** | Both pairs of opposite angles are congruent. | | | | | | |
| **3.** | Exactly one pair of opposite sides are congruent. | | | | | | |
| **4.** | Exactly one pair of opposite sides are parallel. | | | | | | |
| **5.** | Exactly one pair of opposite angles are congruent. | | | | | | |
| **6.** | Consecutive angles are supplementary. | | | | | | |

**Give the most specific name for the quadrilateral. *Explain*.**

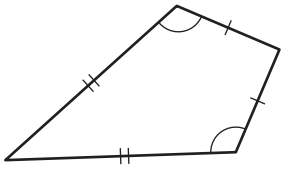
**7.**



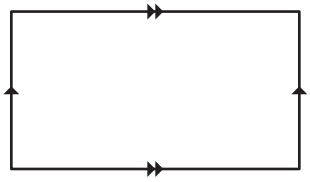
**8.**




**9.**



**10.**

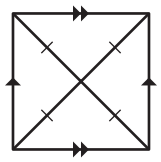


Name _____ Date _____

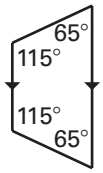
LESSON 8.6 **Practice** *continued*
*For use with pages 570–575*

**Tell whether enough information is given in the diagram to classify the quadrilateral by the indicated name.**

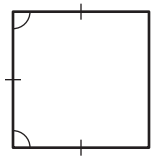
**11.** Rectangle



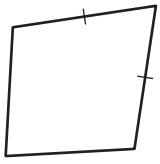
**12.** Isosceles trapezoid




**13.** Rhombus



**14.** Kite



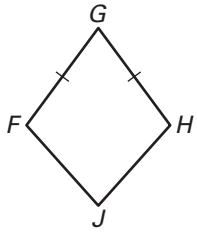
**Points *A*, *B*, *C*, and *D* are the vertices of a quadrilateral. Give the most specific name for *ABCD*. *Justify* your answer.**

**15.** $A(2, 2)$, $B(4, 6)$, $C(6, 5)$, $D(4, 1)$

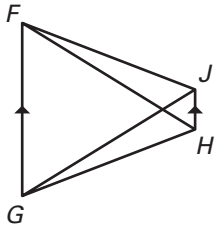
**16.** $A(-5, 1)$, $B(0, -6)$, $C(5, 1)$, $D(0, 3)$

**In Exercises 17 and 18, which two segments or angles must be congruent so that you can prove that *FGHJ* is the indicated quadrilateral? There may be more than one right answer.**

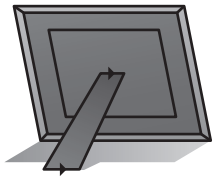
**17.** Kite




**18.** Isosceles trapezoid




**19.** **Picture Frame** What type of special quadrilateral is the stand of the picture frame at the right?



**20.** **Painting** A painter uses a quadrilateral shaped piece of canvas. The artist begins by painting lines that represent the diagonals of the canvas. If the lengths of the painted lines are congruent, what types of quadrilaterals could represent the shape of the canvas? If the painted lines are also perpendicular, what type of quadrilateral represents the shape of the canvas?

Name _____ Date _____

LESSON 8.7

# Practice

*For use with pages 576–581*

**Find the side lengths of quadrilaterals *ABCD* and *EFGH* with the given vertices. Then determine if the quadrilaterals are congruent.**

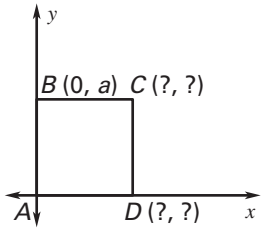
1. $A(-2,1)$, $B(-2, 5)$, $C(2, 5)$, $D(2, 1)$; $E(-3, -1)$ $F(1, -1)$, $G(1, -5)$, $H(-3, -5)$
2. $A(-5,-1)$, $B(0, -1)$, $C(-2, -3)$, $D(-3, -3)$; $E(0, 4)$ $F(10, 4)$, $G(6, 0)$, $H(4, 0)$
3. $A(-2, 1)$, $B(2, 1)$, $C(2, -1)$, $D(-2, -1)$; $E(-1, 2)$ $F(1, 2)$, $G(1, -2)$, $H(-1, -2)$
4. $A(-5, 5)$, $B(0, 5)$, $C(0, 0)$, $D(-5, 0)$; $E(1, 0)$ $F(4, 4)$, $G(9, 4)$, $H(6, 0)$

**Find the side lengths of quadrilaterals *ABCD* and *EFGH* with the given vertices. Then determine if the quadrilaterals are similar.**

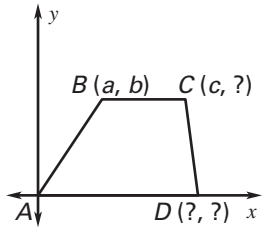
5. $A(0, 0)$, B$(3, 3)$, $C(6, 3)$, $D(9, 0)$; $E(0, -1)$ $F(6, -1)$, $G(4, -3)$, $H(2, -3)$
6. $A(1, 0)$, $B(1, 6)$, $C(3, 6)$, $D(3, 0)$; $E(5, 0)$ $F(5, 9)$, $G(8, 9)$, $H(8, 0)$
7. $A(-3, 0)$, $B(-3, 2)$, $C(3, 2)$, $D(3, 0)$; $E(-4, -1)$ $F(-4, 3)$, $G(4, 3)$, $H(4, -1)$
8. $A(1, 0)$, $B(1, 1)$, $C(2, 1)$, $D(2, 0)$; $E(0,-1)$ $F(0, 2)$, $G(3, 2)$, $H(3, -1)$

**Without introducing any new variables, supply the missing coordinates.**

9. Square *ABCD*

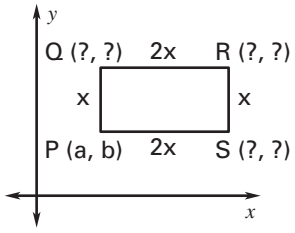



10. Trapezoid *ABCD*




**In exercises 11–13, use the following information.**

Quadrilateral *PQRS* shown at the right is a rectangle. The coordinates of *P* are $(a, b)$ and the length of a short side is $x$, the length of a long side is twice as long as a short side.




11. Find the coordinates of *Q, R,* and *S*.
12. Find the coordinates of the midpoints of the sides of *PQRS*.
13. Find the coordinates of the center of *PQRS*.