LESSON 5.8

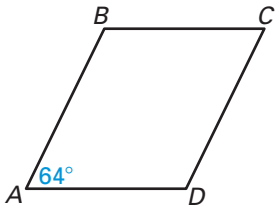
Exercise Set A

MM1G1e Use the coordinate plane to investigate properties of and verify conjectures related to triangles and quadrilaterals.

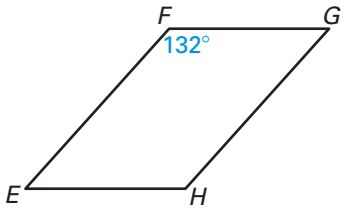
MM1G3d Understand, use, and prove properties of and relationships among special quadrilaterals: parallelogram, rectangle, rhombus, square, trapezoid, and kite.

Find the measure of the indicated angle in the parallelogram.

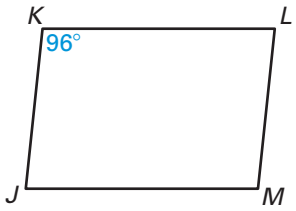
1. Find $m\angle B$.



2. Find $m\angle G$.

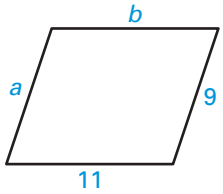


3. Find $m\angle M$.



Find the value of each variable in the parallelogram.

4.



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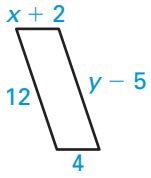

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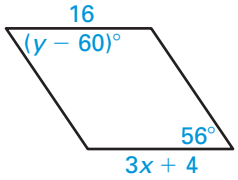

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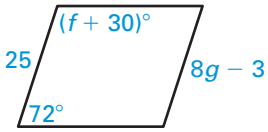

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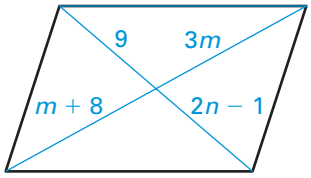

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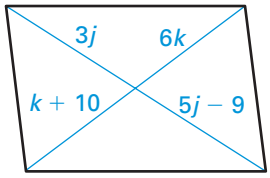


10. In $\square WXYZ$, $m\angle W$ is 50 degrees more than $m\angle X$. Sketch $\square WXYZ$. Find the measure of each interior angle. Then label each angle with its measure.

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. $m\angle AED$

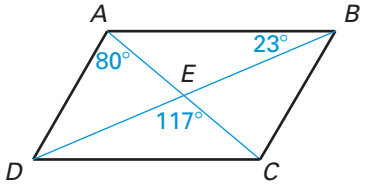
15. $m\angle ECB$

16. $m\angle BAD$

17. $m\angle DCE$

18. $m\angle ADC$

19. $m\angle DCB$



UNIT 5

Exercise Set A *(continued)*

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

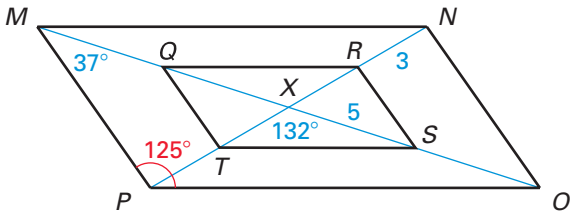
23. $m\angle NMQ$

24. $m\angle NXO$

25. $m\angle MNP$

26. $m\angle NPO$

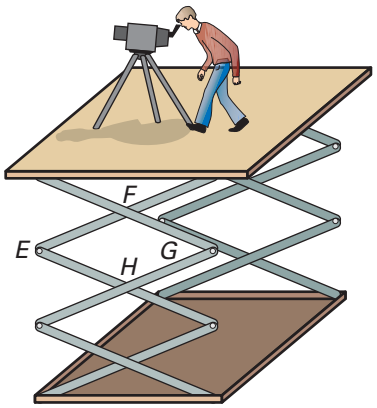
27. $m\angle NOP$



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*.

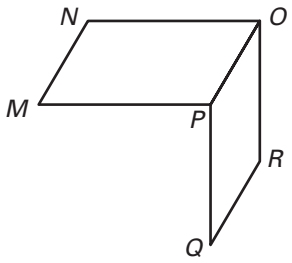


29. In parallelogram $RSTU$, the ratio of RS to ST is 5 : 3. Find RS if the perimeter of $\square RSTU$ is 64.

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.

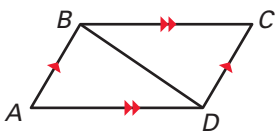
PROVE: $\overline{MN} \cong \overline{QR}$



31. **Proof** Write a two-column proof of Theorem 5.18.

GIVEN: $ABCD$ is a parallelogram.

PROVE: $\overline{AB} \cong \overline{CD}$, $\overline{BC} \cong \overline{AD}$



LESSON 5.8

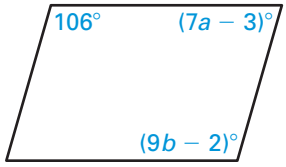
Exercise Set B

MM1G1e Use the coordinate plane to investigate properties of and verify conjectures related to triangles and quadrilaterals.

MM1G3d Understand, use, and prove properties of and relationships among special quadrilaterals: parallelogram, rectangle, rhombus, square, trapezoid, and kite.

Find the value of each variable in the parallelogram.

1.



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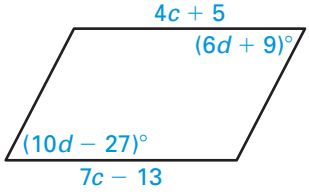

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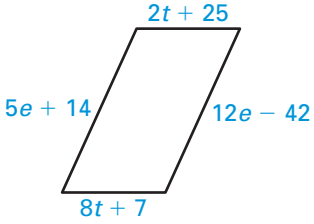

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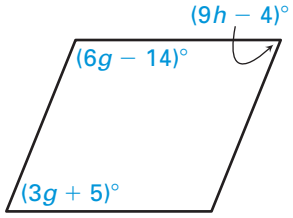

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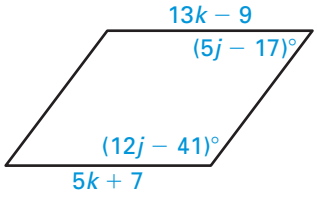

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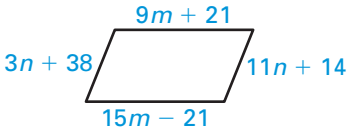

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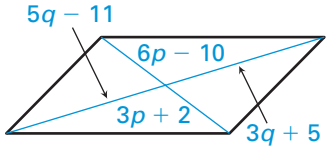

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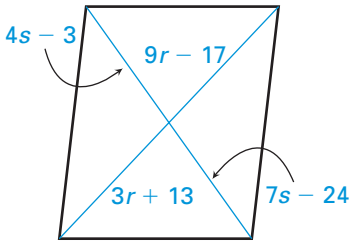

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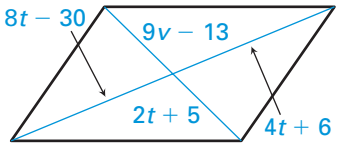


10. The coordinates for $\square ABCD$ are $A(-1, 3)$, $B(4, 2)$, $C(2, -1)$, and $D(-3, 0)$. Plot the points and draw $\square ABCD$ on a coordinate plane. Then draw the diagonals $\overline{AC}$ and $\overline{BD}$. Label the intersection of the diagonals as point E. What are the coordinates of point E?

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

11. AE

12. AD

13. EB

14. DB

15. AB

16. Perimeter of $\triangle AEB$

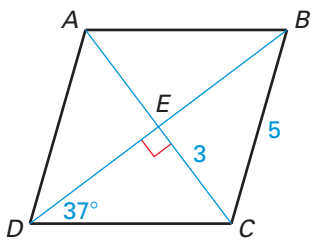
17. $m\angle DBA$

18. $m\angle DEC$

19. $m\angle ACD$

20. $m\angle CAB$

21. Perimeter of $\square ABCD$

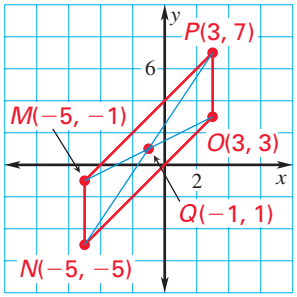


Exercise Set B *(continued)*

22. The measure of one interior angle of a parallelogram is 2.6 times the measure of another angle. Find the measure of each angle.

23. The measure of one interior angle of a parallelogram is 57.8 degrees more than the measure of another angle. Find the measure of each angle.

Use the diagram of $\square MNOP$ at the right.



24. Use the Distance Formula to show $\overline{MP} \cong \overline{NO}$.

25. Use the Distance Formula to show $\overline{MN} \cong \overline{PO}$.

26. Find the slope of $\overline{MP}$ and $\overline{NO}$.

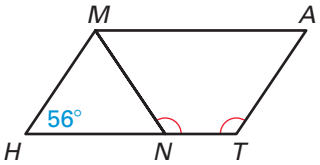
27. How do the slopes found in Exercise 26 show that $\overline{MP}$ and $\overline{NO}$ are parallel?

28. Use the Distance Formula to show that the diagonals $\overline{MO}$ and $\overline{NP}$ bisect each other.

29. Copy and complete the proof.

GIVEN: $MATH$ is a $\square$.
$m\angle MHN = 56°$
$\angle MNT \cong \angle ATN$

PROVE: $m\angle MNH = 56°$



Statements	Reasons
1. $MATH$ is a $\square$.	**1.** ?
2. $\angle MHN$ and $\angle ATN$ are supplementary.	**2.** ?
3. ?	**3.** Definition of supplementary angles
4. $m\angle MHN = 56°$	**4.** ?
5. ?	**5.** Substitution property of equality
6. $m\angle ATN = 124°$	**6.** ?
7. ?	**7.** Given
8. $m\angle MNT = m\angle ATN$	**8.** ?
9. ?	**9.** Transitive property of equality
10. $m\angle MNT + m\angle MNH = 180°$	**10.** ?
11. ?	**11.** Substitution property of equality
12. $m\angle MNH = 56°$	**12.** ?

UNIT 5