LESSON 5.11

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.

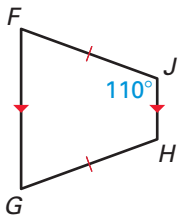
Points *A*, *B*, *C*, and *D* are the vertices of a quadrilateral. Determine whether *ABCD* is a trapezoid.

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

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

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

3.



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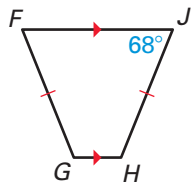
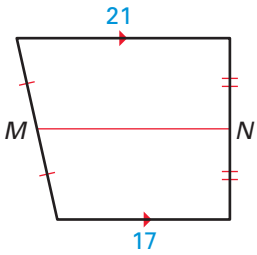


Find the length of the midsegment of the trapezoid.

5.



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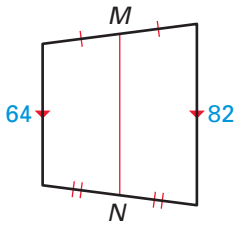
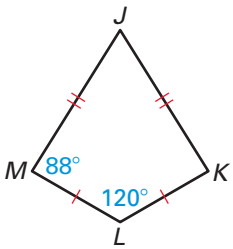


***JKLM* is a kite. Find $m\angle K$.**

7.



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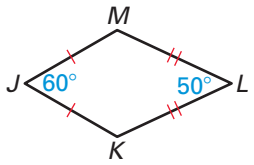
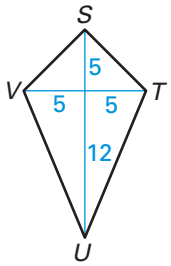


Use Theorem 5.33 and the Pythagorean Theorem to find the side lengths of the kite. Write the lengths in simplest radical form.

9.



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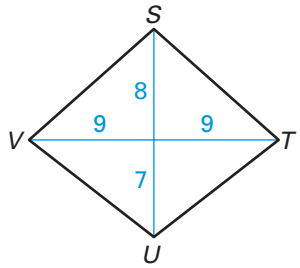
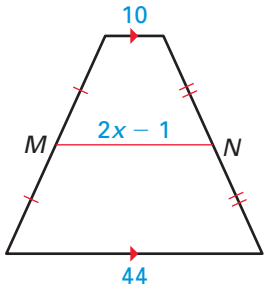


UNIT 5

Exercise Set A *(continued)*

Find the value of *x*.

11.



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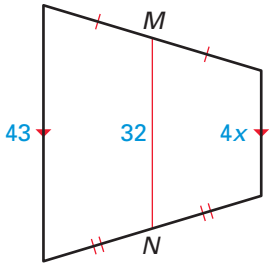

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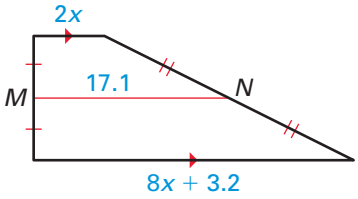

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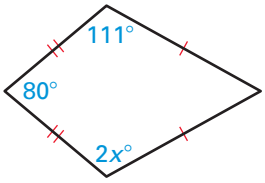
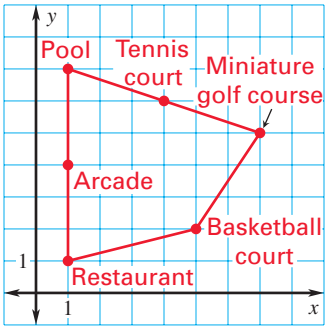


15. Maps Use the map shown at the right. The lines represent a sidewalk connecting the locations on the map.

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

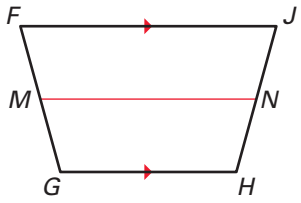
b. A sidewalk is built that connects the arcade, tennis court, miniature golf course, and restaurant. What is the shape of the sidewalk?

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



16. 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?

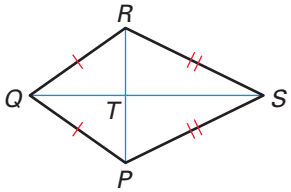
17. Proof $\overline{MN}$ is the midsegment of isosceles trapezoid *FGHJ*. Write a paragraph proof to show that *FMNJ* is an isosceles trapezoid.



18. Proof Prove Theorem 5.33.

GIVEN: *PQRS* is a kite.
$\overline{PQ} \cong \overline{RQ}$, $\overline{PS} \cong \overline{RS}$

PROVE: $\overline{PR} \perp \overline{QS}$



UNIT 5

LESSON 5.11

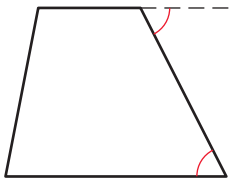
Exercise Set B

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

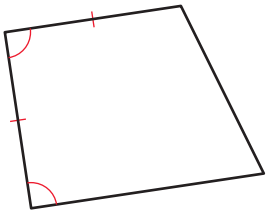
MM1G3d Understand, use, and prove properties of and relationships among special quadrilaterals: parallelogram, rectangle, rhombus, square, trapezoid, and kite.

Determine whether the quadrilateral is a trapezoid. If it is, is it an isosceles trapezoid?

1.



2.



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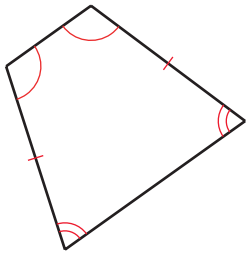
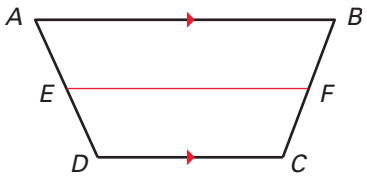


Quadrilateral *ABCD* is a trapezoid with midsegment $\overline{EF}$. Use the given information to answer the following.



4. If $m\angle B = 73°$, then $m\angle C =$ __?__.

5. If $m\angle A = 51°$ and $m\angle C = 105°$, then $m\angle D =$ __?__.

6. If $m\angle A = 48°$ and $m\angle C = 112°$, then $m\angle CFE =$ __?__.

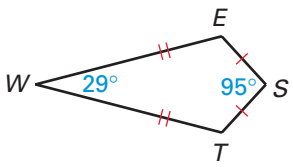
7. If $AB = 28$ and $DC = 13$, then $EF =$ __?__.

8. If $EF = 13$ and $DC = 6$, then $AB =$ __?__.

9. If $EF = x + 5$ and $DC + AB = 4x + 6$, then $EF =$ __?__.

***WEST* is a kite. Find the measures of the missing angles.**

10.



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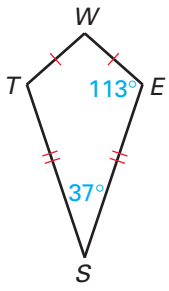

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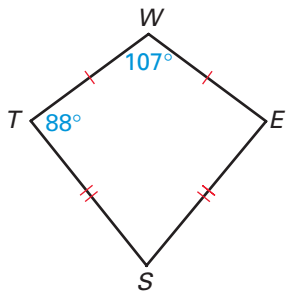
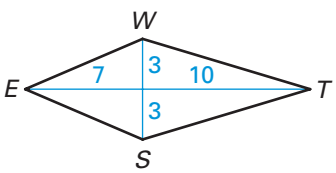


Use Theorem 5.33 and the Pythagorean Theorem to find the side lengths of the kite. Write the lengths in simplest radical form.

13.



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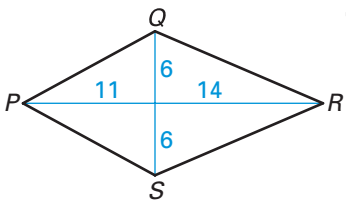

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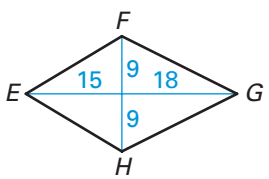
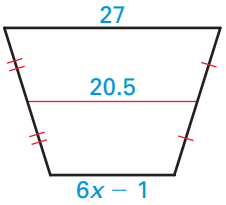


UNIT 5

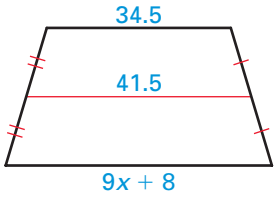
Exercise Set B *(continued)*

Find the value of *x*.

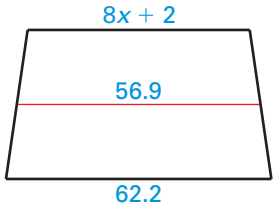
16.



17.



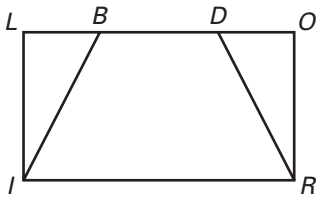
18.



19. In an isosceles trapezoid, if one pair of base angles is twice the measure of the second pair of base angles, what are the measures of the angles?

20. If the midsegment of a trapezoid measures 6 units long, what is true about the lengths of the bases of the trapezoid?

21. Copy and complete the proof.

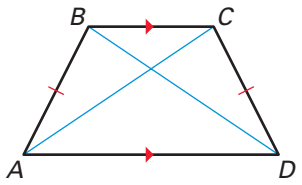


GIVEN: $LORI$ is a rectangle.
$\overline{LB} \cong \overline{DO}$

PROVE: $BIRD$ is an isosceles trapezoid.

Statements	Reasons
1. $LORI$ is a rectangle.	**1.** ?
2. $\angle ILB$ and $\angle ROB$ are right angles.	**2.** ?
3. ?	**3.** All right $\measuredangle$s are $\cong$.
4. $\overline{LI} \cong \overline{OR}$	**4.** ?
5. ?	**5.** Given
6. $\triangle LBI \cong \triangle ODR$	**6.** ?
7. ?	**7.** Corresponding parts of $\cong$ $\measuredangle$s are $\cong$.
8. ?	**8.** Definition of $\parallelogram$
9. $BIRD$ is an isosceles trapezoid.	**9.** ?

22. **Proof** Write a two-column proof of part of Theorem 5.31.



GIVEN: $ABCD$ is an isosceles trapezoid.

$\overline{BC} \parallel \overline{AD}, \overline{AB} \cong \overline{CD}$

PROVE: $\overline{AC} \cong \overline{BD}$

UNIT 5