LESSON 6.5

NAME _____ DATE _____

# Practice with Examples

**For use with pages 356–363**

**GOAL** **Use properties of trapezoids and kites**



## VOCABULARY

A **trapezoid** is a quadrilateral with exactly one pair of parallel sides. The parallel sides of a trapezoid are the **bases** of the trapezoid.

For each of the bases of a trapezoid, there is a pair of **base angles,** which are the two angles that have that base as a side.

The nonparallel sides of a trapezoid are the **legs** of the trapezoid.

If the legs of a trapezoid are congruent, then the trapezoid is an **isosceles trapezoid.**

The **midsegment** of a trapezoid is the segment that connects the midpoints of its legs.

A **kite** is a quadrilateral that has two pairs of consecutive congruent sides, but opposite sides are not congruent.

**Theorem 6.14** If a trapezoid is isosceles, then each pair of base angles is congruent.

**Theorem 6.15** If a trapezoid has a pair of congruent base angles, then it is an isosceles trapezoid.

**Theorem 6.16** A trapezoid is isosceles if and only if its diagonals are congruent.

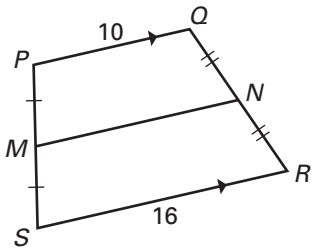
**Theorem 6.17** The midsegment of a trapezoid is parallel to each base and its length is one half the sum of the lengths of its bases.

**Theorem 6.18** If a quadrilateral is a kite, then its diagonals are perpendicular.

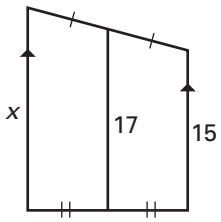
**Theorem 6.19** If a quadrilateral is a kite, then exactly one pair of opposite angles is congruent.

## EXAMPLE 1 *Finding Midsegment Lengths of Trapezoids and Using Algebra*

**a.** Find the length of the midsegment *MN*.




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



NAME _____ DATE _____

# Practice with Examples

**For use with pages 356–363**



### SOLUTION

**a.** Use the Midsegment Theorem for Trapezoids.

$$MN = \frac{1}{2}(PQ + SR) = \frac{1}{2}(10 + 16) = \frac{1}{2}(26) = 13$$

**b.** $17 = \frac{1}{2}(15 + x)$ Midsegment Theorem for Trapezoids

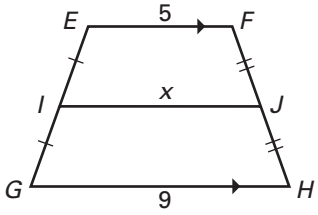
$34 = 15 + x$ Multiply each side by 2.

$19 = x$ Subtract.

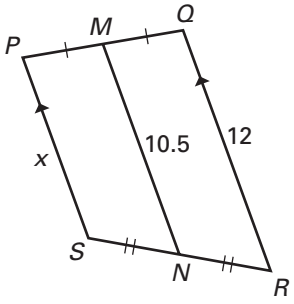
## *Exercises for Example 1*

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

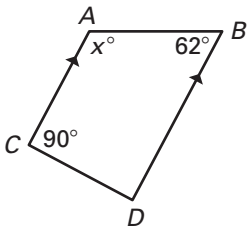
**1.**




**2.**




**3.**



NAME _____ DATE _____

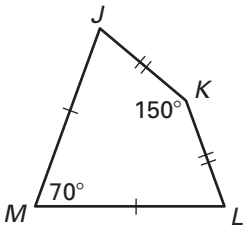
# Practice with Examples

**For use with pages 356–363**



## EXAMPLE 2 Using Properties of Kites

*JKLM* is a kite. What is $m\angle J$?




### SOLUTION

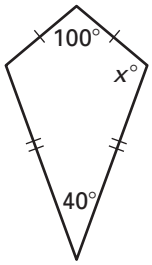
*JKLM* is a kite, so $\angle J \cong \angle L$ and $m\angle J = m\angle L$.

| | |
|---|---|
| $2(m\angle J) + 150° + 70° = 360°$ | Sum of measures of int. $\measuredangle$ of a quad. is 360°. |
| $2(m\angle J) = 140°$ | Simplify. |
| $m\angle J = 70°$ | Divide each side by 2. |

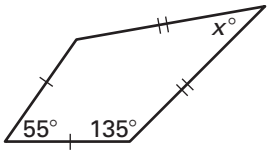
### Exercises for Example 2

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

**4.**




**5.**




**6.**