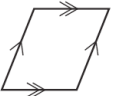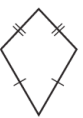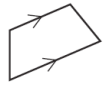# Geometry Lesson 19

Objective: TSW recognize and use different quadrilaterals.

_____ - A polygon with four sides.

Quadrilaterals are classified according to the number of congruent and _____ sides they have.

In addition to the quadrilaterals listed, there are three types of _____.
Parallelograms are classified based on whether or not their sides are congruent and whether or not they have right angles.

Quadrilateral	Properties	Example
Parallelogram	Both pairs of opposite sides are parallel.	
Kite	Exactly two pairs of consecutive sides are congruent.	
Trapezoid	Exactly one pair of opposite sides are parallel.	
Trapezium	No sides are parallel.	

Parallelogram	Properties	Example
Rectangle	A parallelogram with four right angles	
Rhombus	A parallelogram with four congruent sides	
Square	A parallelogram with four right angles and four congruent sides	

Reading Math

Sometimes symbols are used to name quadrilaterals. For example, ▭PQRS means "rectangle PQRS" and ▱WXYZ means "parallelogram WXYZ."

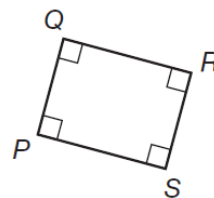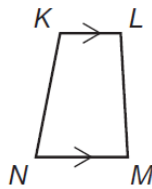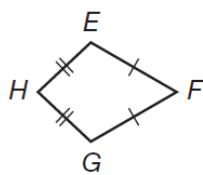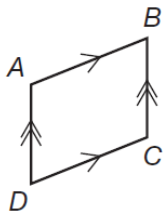Some quadrilaterals can be named in several ways.
For example, a square is also a rectangle, a rhombus, and a parallelogram; a kite is also a trapezium.

Though parallelograms can often be given several names, always try to find the _____.
For example, a quadrilateral with four right angles could be called a parallelogram, but it is more specific to call it a rectangle.

Example 1 Classifying Quadrilaterals
Classify each quadrilateral. Give multiple names if possible.

SOLUTION

Example 2 Sketching Quadrilaterals

Sketch each quadrilateral based on its description.

a. In quadrilateral *ABCD*, each side measures 3 feet.

    SOLUTION

b. In quadrilateral *WXYZ*, each angle measures 90°.

    SOLUTION

c. In quadrilateral *RSTU*, $\overline{ST} \parallel \overline{RU}$.

    SOLUTION

$$Area\ of\ a\ Rectangle = b \cdot h$$
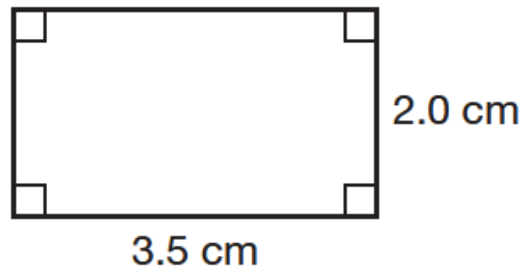$$Area\ of\ a\ Square = s^2$$

Example 3 Finding Perimeters and Areas of Rectangles and Squares

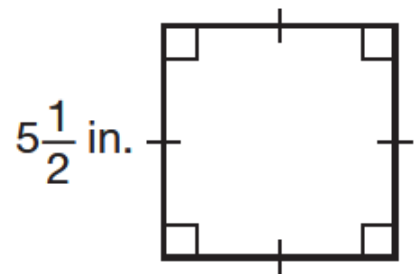a. Determine the perimeter and area of this rectangle.

SOLUTION

    The length of the rectangle is 3.5 centimeters and its width is 2.0 centimeters.

2.0 cm

3.5 cm

b. Determine the perimeter and area of this square.

    SOLUTION

    The square has side lengths of $5\frac{1}{2}$ inches.

$5\frac{1}{2}$ in.

Example 4 Sports

Each side of a baseball diamond measures 30 yards. Each of its corners is a right angle.

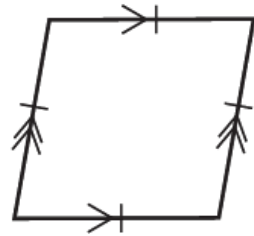a. What kind of quadrilateral is a baseball diamond? Give as many different names for it as possible.

   SOLUTION

b. What distance must a batter run for a homerun?

   SOLUTION

You Try!!!!

a. Classify this quadrilateral. Give multiple names if possible.

b. In quadrilateral $PQRS$, $\overline{PQ} \parallel \overline{RS}$ and $\overline{PS} \parallel \overline{QR}$. Also, $\overline{PQ}$ is approximately twice as long as, $\overline{QR}$. Sketch $PQRS$.