

# ***Unit 10 Properties of Parallelograms***

Date	Target	Assignment	Done!
T 3-13	10.1a	10.1a Worksheet	
W 3-14	10.1b	10.1b Worksheet	
R 3-15	REV/Quiz	10.1 Review and Quiz 10.1	
F 3-16		Half-Day Inservice (10:30/10:40 Release)	
M 3-19	10.2	10.2 Worksheet	
T 3-20	REV/Quiz	10.2 Review and Quiz 10.2	
W 3-21	REV	Unit 10 Test Review	
R 3-22	Test	Unit 10 Test	
F 3-23		Catch up/Makeup Day	

***Target 10.1: Use properties of parallelograms to solve problems***

***10.1a: Use Properties of Parallelograms***

***10.1b: Show that a Quadrilateral is a Parallelogram***

***Target 10.2: Use properties of rhombuses, rectangles, and squares to solve problems***

***Name:*** \_\_\_\_\_

**10.1a– Use Properties of Parallelograms**  
**Target 1: Use properties of parallelograms to solve problems**

**Vocabulary:**

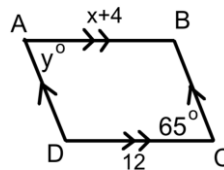
**Parallelogram:** \_\_\_\_\_  
 \_\_\_\_\_

**Opposite Sides and Angles of a Parallelogram**

If a quadrilateral is a \_\_\_\_\_, then  
 its \_\_\_\_\_ and \_\_\_\_\_ are congruent.

**Example 1: Use properties of parallelograms**

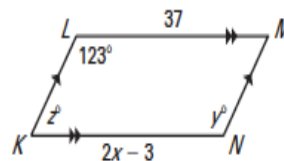
Find the values of  $x$  and  $y$ .



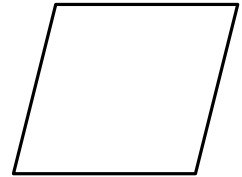
**Consecutive Interior Angles of a Parallelogram**

If a quadrilateral is a \_\_\_\_\_, then  
 its \_\_\_\_\_ are \_\_\_\_\_.

**Example 2: If KLMN is a parallelogram, find the values of  $x$ ,  $y$ , and  $z$ .**

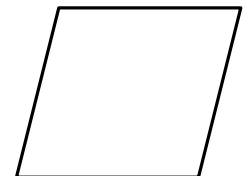


**Annotate Here**



**What property did you use to find the value of  $x$ ?**

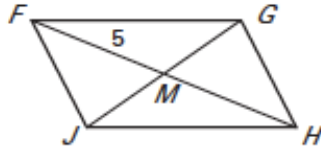
**How about  $y$ ?**



### Diagonals of a Parallelogram

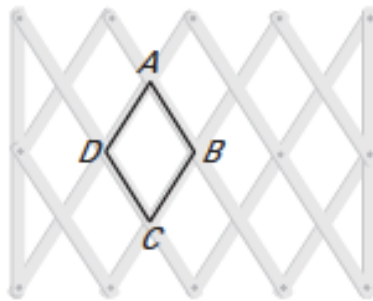
If a quadrilateral is a \_\_\_\_\_, then  
its \_\_\_\_\_.

**Example 3:** Given that  $FGHJ$  is a parallelogram, find  $MH$  and  $FH$ .



**YOU TRY NOW!**

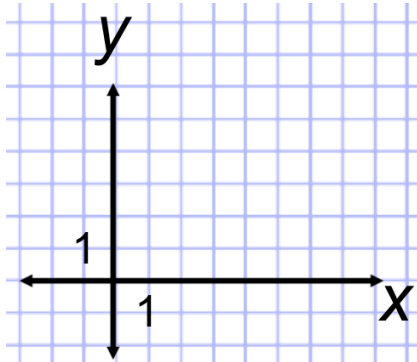
1) Gates As shown, a gate contains several parallelograms. Find  $m\angle ABC$  if  $m\angle DAB = 65^\circ$ .



2) The coordinates of OLMN are  $O(0, 0)$   $L(1, 4)$   $M(7, 4)$   $N(6, 0)$ . The diagonals of OLMN intersect at point P. Find the coordinates of P.

You might need this

$$\text{midpoint} = \left( \frac{x_2 + x_1}{2}, \frac{y_2 + y_1}{2} \right)$$



### Annotate Here

**10.1b– Show that a Quadrilateral is a Parallelogram**  
**Target 1: Use properties of parallelograms to solve problem**

**Opposite Sides of a Parallelogram  
(CONVERSE)**

If both pairs of opposite sides of a quadrilateral are

\_\_\_\_\_, then the quadrilateral is a

\_\_\_\_\_.

**Opposite Angles of a Parallelogram  
(CONVERSE)**

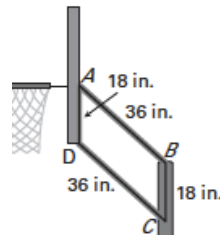
If both pairs of opposite angles of a quadrilateral are

\_\_\_\_\_, then the quadrilateral is a

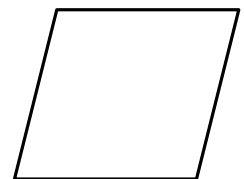
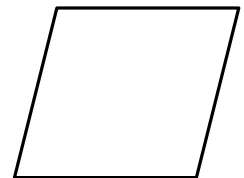
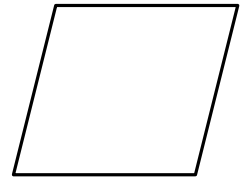
\_\_\_\_\_.

**Example 1: Use properties of parallelograms**

**Basketball** In the diagram,  $\overline{AB}$  and  $\overline{DC}$  represent adjustable supports of a basketball hoop. **Explain why**  $\overline{AD}$  is always parallel to  $\overline{BC}$ .



**Annotate Here**



**One Pair of Sides of a Parallelogram**

If one pair of \_\_\_\_\_ are \_\_\_\_\_ and \_\_\_\_\_, then the quadrilateral is a

\_\_\_\_\_.

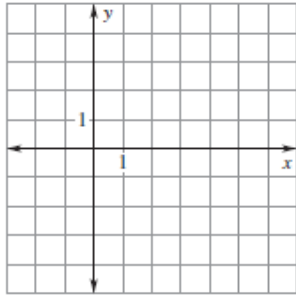
### Bisected Diagonals of a Parallelogram

If the diagonals of a \_\_\_\_\_ bisect \_\_\_\_\_, then the quadrilateral is a \_\_\_\_\_.

#### Example 2: Identify a parallelogram

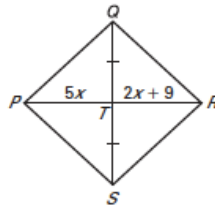
Given the following coordinates, determine if ABCD is a parallelogram. Justify your reasoning using complete sentences and vocabulary.

$A(-2, -3), B(0, 5), C(6, 5), D(4, -3)$



#### Example 3: Use algebra with parallelograms

For what value of  $x$  is quadrilateral PQRS a parallelogram? What is the length of the diagonal PR?

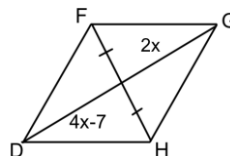


#### YOU TRY NOW!

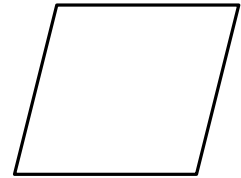
1) What property can you use to show that the quadrilateral is a parallelogram?



2) What is the length of diagonal DG so that quadrilateral DFGH a parallelogram?

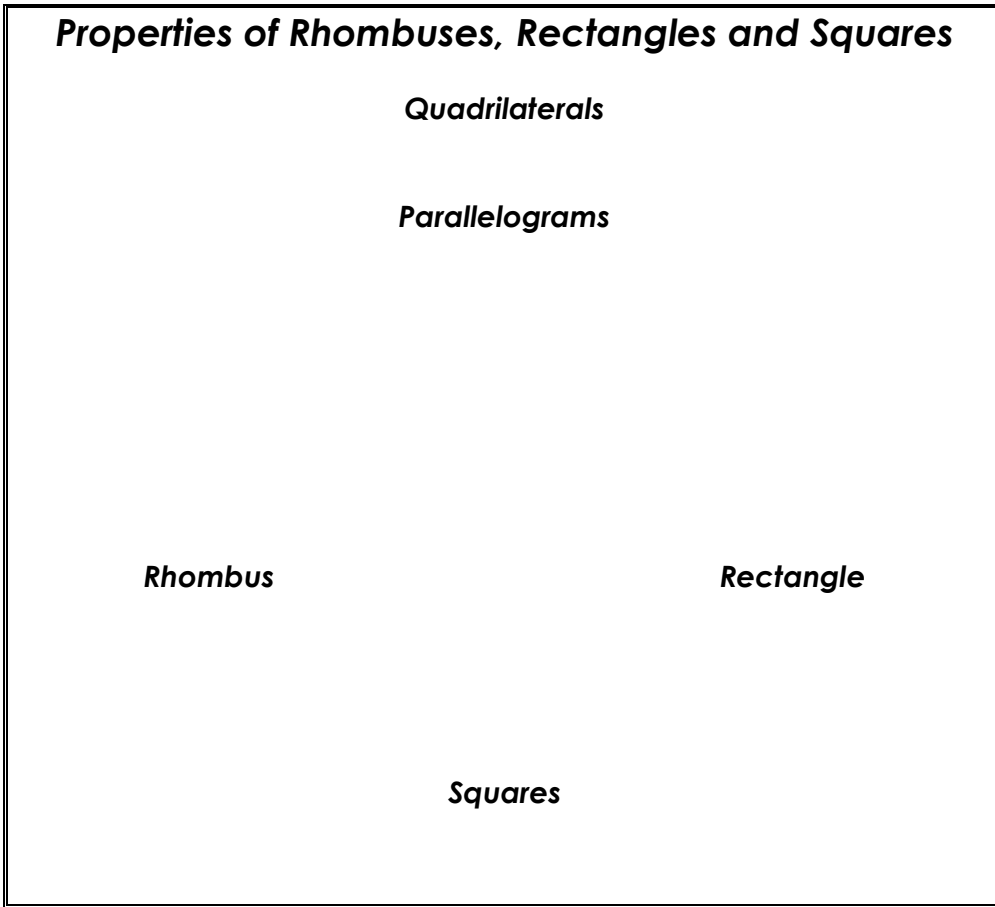


### Annotate Here



1. The quadrilateral is a parallelogram because the diagonals bisect each other.  
2. 14

**10.2– Properties of Rhombuses, Rectangles, and Squares**  
**Target 2: Use properties of rhombuses, rectangles and squares to solve problems**



Annotate Here

***What's the main difference between a rhombus and a rectangle?***

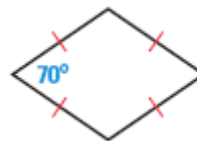
**Example 1: Use properties of parallelograms**

For any rhombus RSTV, decide whether the statement is always or sometimes true.

- a.  $\angle S \cong \angle V$     b.  $\angle T \cong \angle V$

**Example 2: Classify special quadrilaterals**

Classify the special quadrilateral. Explain your reasoning.



### **Diagonals of a Rhombus**

A \_\_\_\_\_ is a \_\_\_\_\_ if and only if its  
\_\_\_\_\_ are \_\_\_\_\_.

A \_\_\_\_\_ is a \_\_\_\_\_ if and only if each  
\_\_\_\_\_ are \_\_\_\_\_.

### **Diagonals of a Rectangle**

A \_\_\_\_\_ is a \_\_\_\_\_ if and only if its  
\_\_\_\_\_ is \_\_\_\_\_.

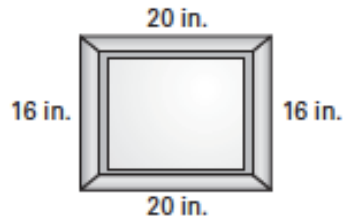
**Example 3: List properties of special parallelograms**

Sketch rectangle  $EFGH$ . List everything you know about it.

### **Annotate Here**

**YOU TRY NOW!**

1) You are building a frame for a painting. The measurements of the frame are shown at the right.



a) The frame must be a rectangle. Given the measurements in the diagram, can you assume that it is? *EXPLAIN!*

b) You measure the diagonals of the frame. The diagonals are about 25.6 inches. What can you conclude about the shape of the frame?

2) Sketch rhombus FGHI. List everything you know about it.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.

**Annotate Here**

1. No. Unless you measure the length of a diagonal and conclude that each corner of the frame is meets at a 90-degree angle.  
 2. Answers may vary.

