EQ: G.CO.11 How do I identify quadrilaterals?

Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question

Week 15, Lesson 1

1. Warm Up
2. Matching Activity
3. Notes
4. TI-NSpire activity
5. Closure

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Identify Quadrilaterals

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Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-u

Warm Up:

Based on what you alread know, sketch a diagram for each of the following AND write ONE characteristic for each.

1. quadrilateral

2. parallelogram

3. square

4. rectangle

Proficient

| G-CO.1 | G.CO.12 | G-CO.9 | G-GPE.4 | G-GPE.5 | G-CO.2 | G-CO.3 | G-CO.4 | G-CO.5 | G-CO.6 | G-CO.7 | G-CO.8 | G-CO.9 | G.CO.10 | G.CO.13 | G-SRT.5 | G-SRT.8 | G-CO.11 | G.CO.13 | G-GPE.4 |

Introduction to Geometry   Transformations   Triangles   Quadrilaterals

1st T
2nd
Fina
1st

1st

MATCHING ACTIVITY

Match the <u>WORD</u> to the <u>PICTURE</u> to the <u>DESCRIPTION</u>.

Answers:

Kite		No pairs of parallel sides 2 pairs of congruent sides
Quadrilateral		4 sides
Square		2 pairs of parallel sides 4 congruent sides 4 right angles
Rhombus		2 pairs of parallel sides 4 congruent sides
Rectangle		2 pairs of parallel sides 2 pairs of congruent sides 4 right angles
Parallelogram		2 pairs of parallel sides 2 pairs of congruent sides
Isosceles Trapezoid		1 pair of parallel sides 1 pair of congruent sides
Trapezoid		1 pair of parallel sides No pairs of congruent sides

quadrilateral	four-sided polygon
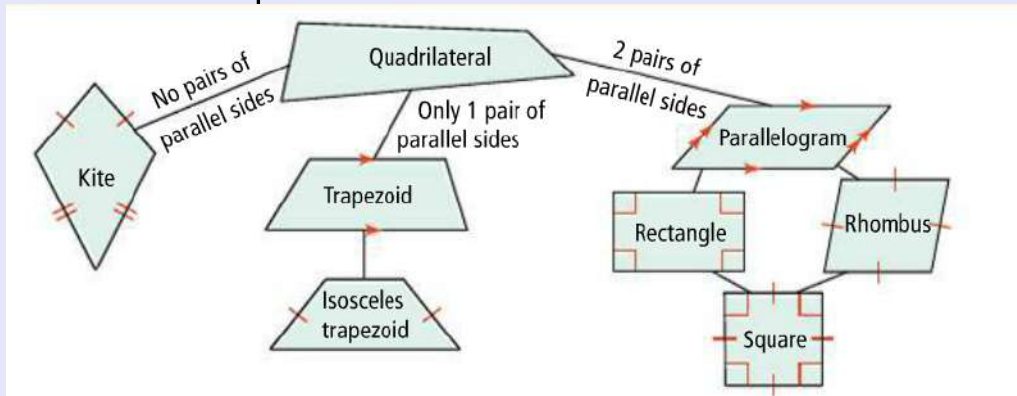
Parallelogram	A quadrilateral with both pairs of opposite sides parallel
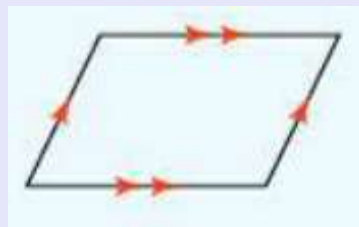
Summary:

TI-NSpire Activity

Welcome to "Properties of Parallelograms."

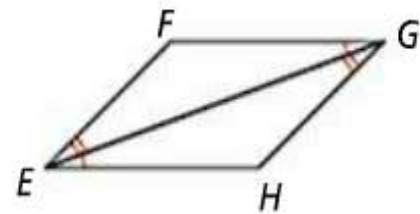To move through the tabs, you can use your mouse, or press [ctrl] and then left/right.

If you need help, please ask your team!

Right Side...

Write a summary that answers the essential question.

Left Side...

53. Name the postulate or theorem that justifies $\triangle EFG \cong \triangle GHE$.

54. Complete each statement.

    a. $\angle FEG \cong$ ■   **b.** $\angle EFG \cong$ ■   **c.** $\angle FGE \cong$ ■

    d. $\overline{EF} \cong$ ■   **e.** $\overline{FG} \cong$ ■   **f.** $\overline{GE} \cong$ ■

EQ: G.CO.11 What are properties of parallelograms?

Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question

Week 15, Lesson 2

1. Warm Up
2. Notes
3. Practice
4. Closure

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Properties of Parallelograms

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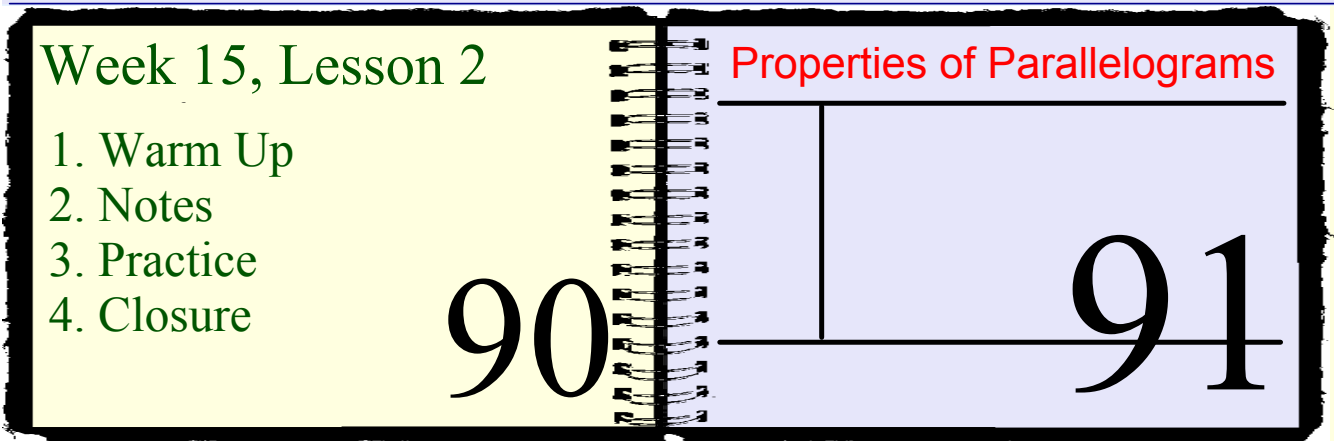
Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-up Warm-u
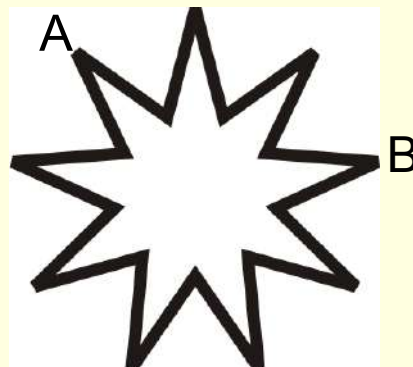
Warm Up:

Final Exam Review

1. Given the two equations below, are the lines parallel, coinciding, perpendicular, or none of the above?
-2x + 3y = 8
 4x - 6y = 4

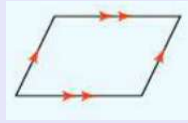2. How many degrees would the shape at the right have to rotate so that point A maps onto point B?
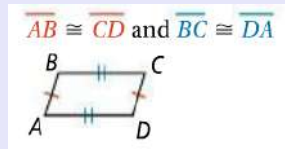
A

B

notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes -

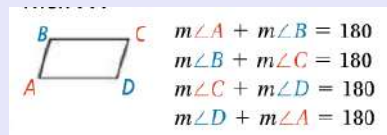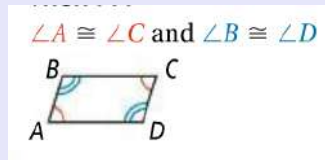| Properties of Parallelograms	1. opposite sides are parallel

2. opposite sides are congruent

$\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$

3. consecutive angles add to $180°$ (are supplementary).

*consecutive angles - angles that share a side.

$m\angle A + m\angle B = 180$
$m\angle B + m\angle C = 180$
$m\angle C + m\angle D = 180$
$m\angle D + m\angle A = 180$

4. Opposite angles are congruent.

$\angle A \cong \angle C$ and $\angle B \cong \angle D$

5. Diagonals bisect each other

$\overline{AE} \cong \overline{CE}$ and $\overline{BE} \cong \overline{DE}$
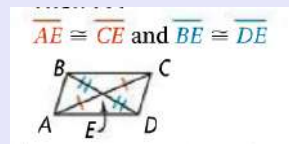
6. 1 pair of sides is both parallel AND congruent.

Summary:

Left-Side Practice

1. Write down as many of the 6 characteristics of parallelograms as you can remember.

2. (a) Find the value of x for the given parallelogram.
(b) What property of parallelograms did you use to solve the problem?
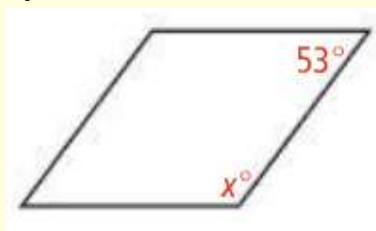
3. (a) Find the value of x for the given parallelogram.
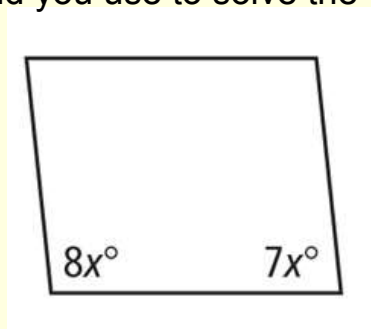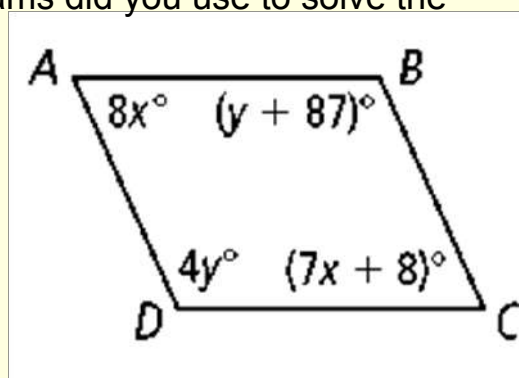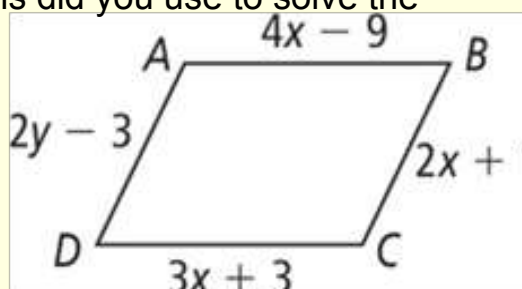(b) What property of parallelograms did you use to solve the problem?

4. (a) Find the value of x for the given parallelogram.
(b) What property of parallelograms did you use to solve the problem?

5. (a) Find the value of x for the given parallelogram.
(b) What property of parallelograms did you use to solve the problem?
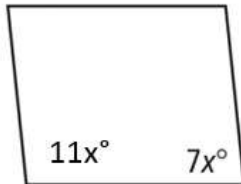
Name _____   pd _____   IAN. page 82
G.CO.11 Practice Worksheet

1. For each of the following parallelograms, solve for the variable(s). Then, describe the property you used.

(a)

$11x°$ $7x°$

(b)

$(4a - 4)°$

$(2a + 30)°$

(c)

$6y + 1$ $x + 7$ $2x - 5$ $4y + 9$
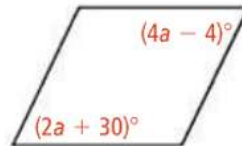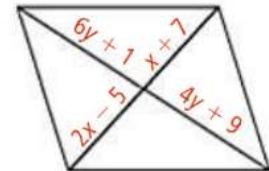
x = _____   a = _____   x = _____ y = _____
Property: Property: Property:
_____   _____   _____
_____   _____   _____
_____   _____   _____

2. Complete the following proof.

Given: $\square ABCD$

Prove: $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$
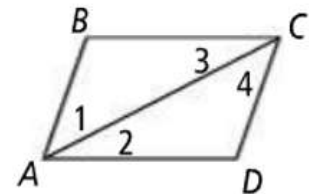
Statements	**Reasons**
1) $ABCD$ is a parallelogram.	1)
2) $\overline{AB} \parallel \overline{CD}$ and $\overline{BC} \parallel \overline{DA}$	2)
3) $\angle 1 \cong \angle 4$ and $\angle 3 \cong \angle 2$	3)
4) $\overline{AC} \cong \overline{AC}$	4)
5) $\triangle ABC \cong \triangle CDA$	5)
6) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$	6)

Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure

Right Side...

Write a summary that answers the essential question.

Left Side...

Compare and Contrast What is the difference between a quadrilateral and a parallelogram?

EQ: G.CO.11 What are properties of parallelograms?

Week 15, Lesson 3

1. Warm Up
2. Left-Side Practice
3. Rotations
4. Closure

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Properties of Parallelograms

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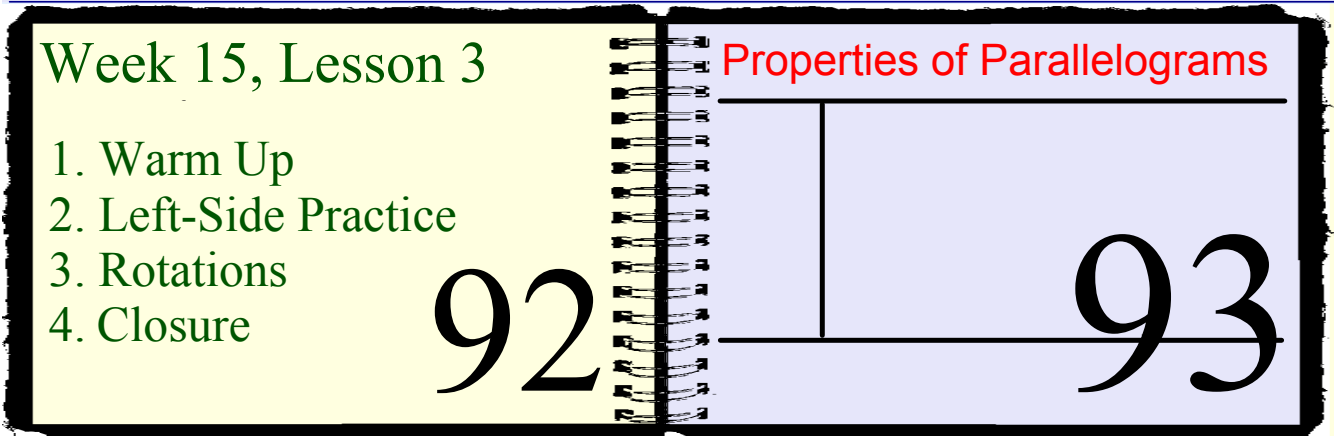
Warm Up:

<u>Before you start, list as many of the 6 properties of parallelograms as you can, from memory</u>.

1. Given the parallelogram below, solve for x and y.
2. What property of parallelograms allows you to solve this problem?

$$2y-9$$

$$3x+1$$ $$5x-1$$

$$y-2$$
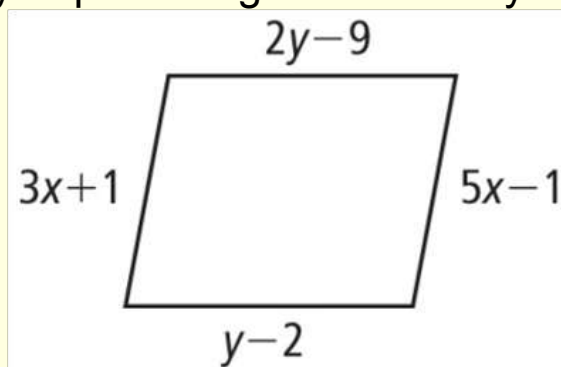
Left-Side practice

Given the diagram at the right, identify if the figure is a parallelogram based on the information given.
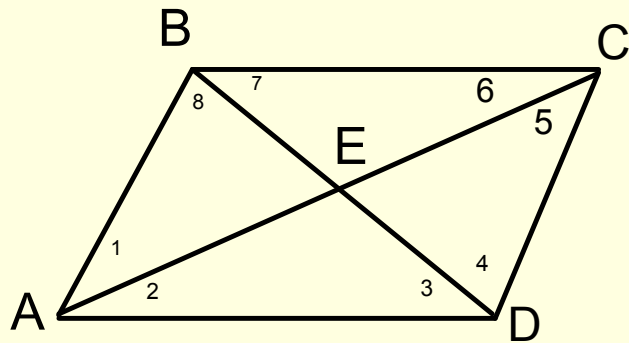
Explain your answer.

1)	AB = CD BC = AD
2.	$\angle ABC \cong \angle CDA$ $\angle BCD \cong \angle BAD$
3.	AB = BC AD=CD
4.	$\angle B = 75°$ $\angle A = 105°$
5.	$\angle B = 75°$ $\angle D = 105°$
6.	E is the midpoint of BD and AC
7.	$\angle 7 \cong \angle 3$ $\angle 5 \cong \angle 1$
8.	$\angle 7 \cong \angle 3$ $\angle 8 \cong \angle 4$
9.	AB = BC = CD = AD

Parallelogram Rotations

For each of the parallelograms shown, solve for each variable. Then, describe what property of parallelograms you used to solve the problem.
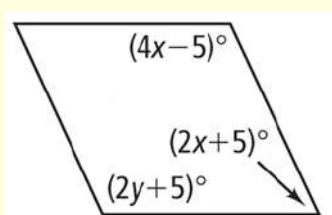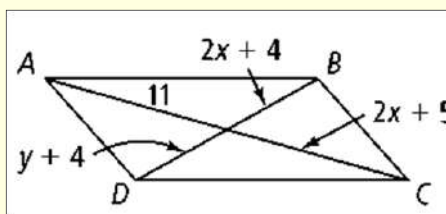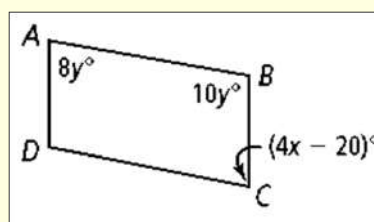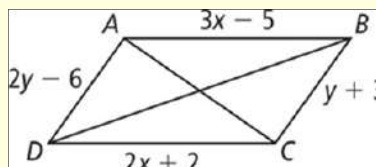
Right Side...

Write a summary that answers the essential question.

Left Side...

Error Analysis Your friend says, "If a quadrilateral has a pair of opposite sides that are congruent and a pair of opposite sides that are parallel, then it is a parallelogram." What is your friend's error? Explain.

EQ: G.CO.11 What are properties of parallelograms?

Week 15, Lesson 4

1. Warm Up
2. TI-NSpire activity
3. Notes
4. Practice
5. Choice Boards
6. Closure

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Properties of Parallelograms

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Warm Up:

Before you start, list as many of the 6 properties of parallelograms as you can, from memory.

Given the parallelogram below, find the values of x and y. Then, explain which property of parallelograms you used to solve this problem.
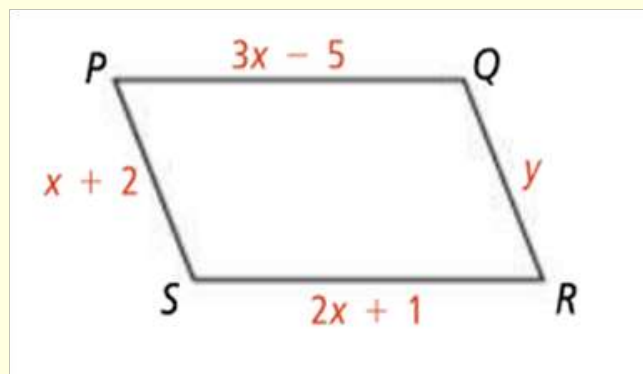
Parallelogram PQRS with side $PQ = 3x - 5$, side $PS = x + 2$, angle at R labeled y, and side $SR = 2x + 1$.

ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity

TI-NSpire Activity

notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes - notes -

Rectangles

Special parallelograms that have the normal 6 characteristics PLUS:

- consecutive sides are perpendicular

- diagonals are congruent

Squares

Special parallelograms that have the normal 6 characteristics PLUS:

- consecutive sides are perpendicular

- diagonals are congruent

- all sides are congruent

Summary:

ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity ICA: In Class Activity
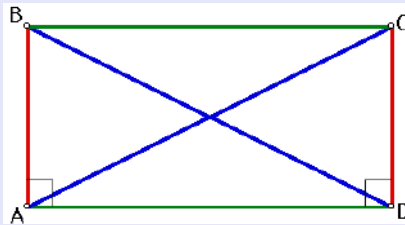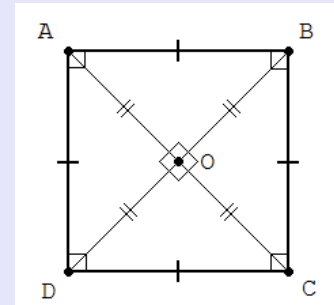
Left-Side Practice

Given the following slopes, write the slope of the line <u>parallel</u> to it and the slope of the line <u>perpendicular</u> to it.

1. m = 1/2

2. m = -3

3. m = 3/4

4. m = -1

5. m = 1

6. (a) Given the quadrilateral below, what is the <u>most specific</u> name for it? What property justifies it as this shape?

$$7y - 1$$

$3x°$ $x°$

$x°$ $3x°$

$$5y + 21$$

(b) Solve for y. Then, find the length of the side.

7. (a) Given the quadrilateral below, what is the <u>most specific</u> name for it? What properties justifies it as this shape?

$$2y$$

$2y$ $2x + 2$ $2y$

   $3x - 5$

$$2y$$

(b) Find the value of x and the length of the diagonal.

8. Complete the following proof.

Given: $\square ABCD$

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

	STATEMENTS		REASONS
1	$\square ABCD$	1	Given
2	Draw segment from A to C	2	Two points determine exactly one line.
3	$\overline{AB} \parallel \overline{CD}, \overline{AD} \parallel \overline{BC}$	3	
4	$\sphericalangle 1 \cong \sphericalangle 2, \sphericalangle 3 \cong \sphericalangle 4$	4	
5	$\overline{AC} \cong \overline{AC}$	5	
6	$\triangle ABC \cong \triangle CDA$	6	
7	$\overline{AB} \cong \overline{CD}, \overline{BC} \cong \overline{AD}$	7	

9. For rectangle ABCD, the slope of AB is 1/2. Fill in the slopes for the remaining sides.
Slope of AB = 1/2
Slope of BC = _____
Slope of CD = _____
Slope of AD = _____

Quadrilaterals Choice Board   Name _____ pd ____

5 pts	1) What formula can you use to find the length of a segment?	2) What formula can you use to show that two sides are perpendicular?	3) What is the length of the segment with the following endpoints? A(-2,6) and B(4,9)

10 pts			

20 pts			

| 50 pts	2 ...		

Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure Closure

Right Side...

Write a summary that answers the essential question.

Left Side...

EQ: G.CO.11 What are properties of parallelograms?

Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question Essential Question

Week 15, Wednesday

1. Warm Up
2. Practice
3. Closure

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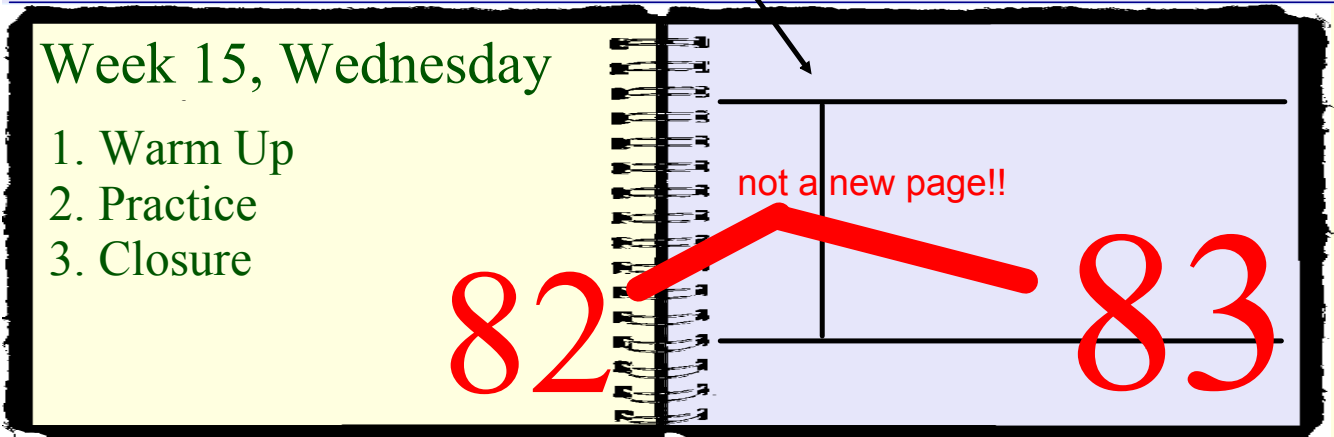
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Warm Up:

1. From memory, list as many of the 6 properties of parallelograms as you can.

2. Given the parallelogram at the right, find the values of x and y. Then, describe the property you used to solve this problem.
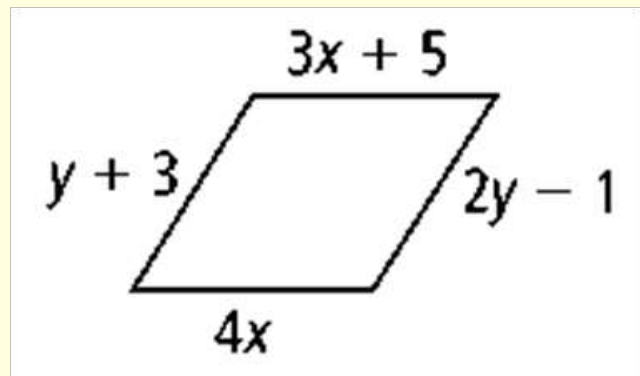
$3x + 5$

$y + 3$

$2y - 1$

$4x$

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Extra Practice
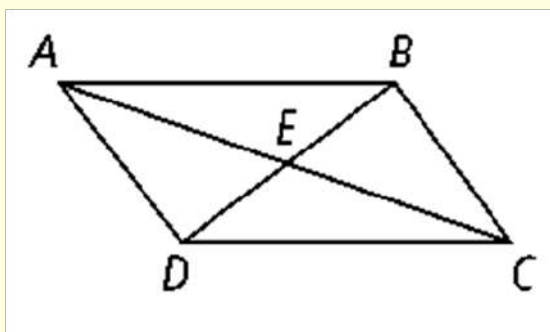
Using the diagram above, describe the ways you could prove ABCD is a parallelogram.