

DLT  
 Blue HW WS  
 Finish Buff D5 Notes  
 Do D6 Notes  
 Go away

Jan 15-11:15 AM

1/15

**Math Review**

Use the diagrams to determine the measure of the angle.

60° 120° 90°

108° 135° 71° 45°

1.  $m\angle 1$

2.  $m\angle 2$

3.  $m\angle 3$

4.  $m\angle 4$

5.  $m\angle 5$

6.  $m\angle 6$

$108 + 135 + 71 + \angle 4 = 360$   
 $314 + \angle 4 = 360$   
 $\angle 4 =$

Warm Up

7.5 Properties of Trapezoids and Kites

Students will be able to:

- Use properties of trapezoids and kites.
- Use the Trapezoid Midsegment Theorem to find distances.
- Identify quadrilaterals.

Feb 3-9:18 PM

What is a trapezoid? NOT A PARALLELOGRAM

A quadrilateral with ONE pair of parallel sides.

Feb 3-9:32 PM

A trapezoid is an **isosceles trapezoid** when the legs are congruent.

legs are side not ||

Feb 3-9:33 PM

Show that  $ORST$  is a trapezoid. Then decide whether it is isosceles. NOT

2 sides ||

slope:  
 $RS = \frac{1}{2}$   
 $OT = \frac{2}{4} = \frac{1}{2}$

yes!

Example 1

The points  $A(-5, 6)$ ,  $B(4, 9)$ ,  $C(4, 4)$ , and  $D(-2, 2)$  form the vertices of a quadrilateral. Show that  $ABCD$  is a trapezoid. Then decide whether it is isosceles.

Monitoring Progress 1

Isosceles Trapezoid Base Angles Theorem  
 If a trapezoid is isosceles, then each pair of base angles is congruent.

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

Theorem

Isosceles Trapezoid Base Angles Converse  
 If a trapezoid has a pair of congruent base angles, then it is an isosceles trapezoid.

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

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Isosceles Trapezoid Diagonals Theorem  
 A trapezoid is isosceles if and only if its diagonals are congruent.

$AC \cong DB$

Feb 3-9:39 PM

The stone above the arch in the diagram is an isosceles trapezoid. Find  $m\angle K$ ,  $m\angle M$ , and  $m\angle J$ .

$\angle K = 85^\circ$

$85 + x = 180$   
 $x = 95^\circ$   
 OR

$85 + 85 + x + x = 360$   
 $2x = 190$   
 $x = 95^\circ$

Example 2

Use trapezoid EFGH.  
 If  $EG = FH$ , is trapezoid  $EFGH$  isosceles? Explain.

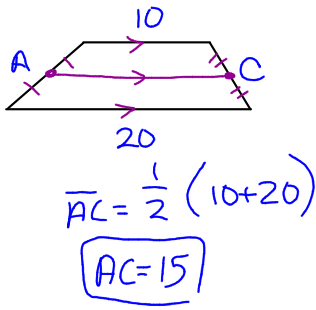
yes! diagonals  $\cong$

If  $m\angle HEF = 70^\circ$  and  $m\angle FGH = 110^\circ$ , is trapezoid  $EFGH$  isosceles? Explain.

NEI

Monitoring Progress 2-3

What is a midsegment of a trapezoid?



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Trapezoid Midsegment Theorem

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

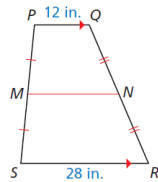


Theorem

In the diagram,  $\overline{MN}$  is the midsegment of trapezoid  $PQRS$ . Find  $MN$ .

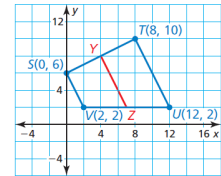
$$MN = \frac{1}{2}(12+28)$$

$$MN = 20$$



Example 3

Find the length of midsegment  $\overline{YZ}$  in trapezoid  $STUV$ .



Example 4

In trapezoid  $JKLM$ ,  $\angle J$  and  $\angle M$  are right angles, and  $JK = 9$  centimeters. The length of midsegment  $\overline{NP}$  of trapezoid  $JKLM$  is 12 centimeters. Sketch trapezoid  $JKLM$  and its midsegment. Find  $ML$ . Explain your reasoning.

Flip Chart (Trapezoids)

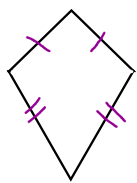
Monitoring Progress 4-5

Jan 9-12:11 PM

**What is a kite?** *Not a parallelogram*

A quadrilateral where 2 pairs of consecutive sides are congruent and 1 pair of opposite angles are congruent.

*next to*

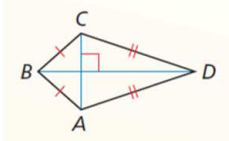


Theorem

**Kite Diagonals Theorem**

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

*90° R+L's*

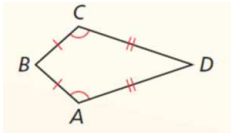


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**Kite Opposite Angles Theorem**

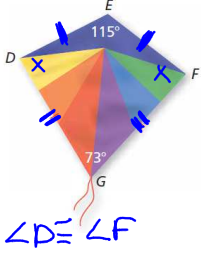
If a quadrilateral is a kite, then exactly one pair of opposite angles are congruent.

$\angle A \cong \angle C$



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Find  $m\angle D$  in the kite shown.



$115 + x + 73 + x = 360$   
 $188 + 2x = 360$   
 $2x = 172$   
 $x = 86^\circ$

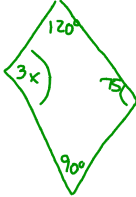
$\angle D \cong \angle F$

Example 5

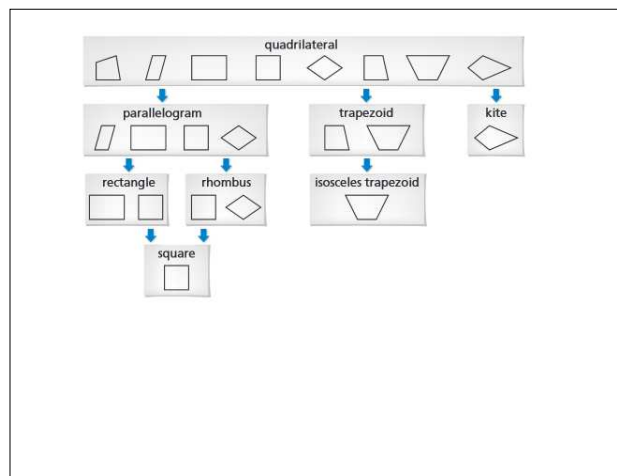
In a kite, the measures of the angles are  $3x^\circ$ ,  $75^\circ$ ,  $90^\circ$ , and  $120^\circ$ . Find the value of  $x$ . What are the measures of the angles that are congruent?

*you cant draw an example yet*

$3x + 75 + 90 + 120 = 360$   
 $3x + 285 = 360$   
 $3x = 75$   
 $x = 25$

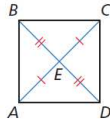


Monitoring Progress 6



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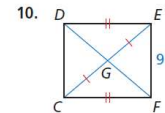
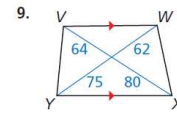
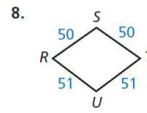
What is the most specific name for quadrilateral  $ABCD$ ? Explain.



Quadrilateral  $DEFG$  has at least one pair of opposite sides congruent. What types of quadrilaterals meet this condition?

Example 6

Give the most specific name for the quadrilateral. Explain your reasoning.



Monitoring Progress 7-10

Geometry: Quadrilaterals and Other Polygons  
7.3C Properties of Trapezoids and Kites Worksheet

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

1. Find the measure of the segment for the following trapezoids.

a. Find  $MN$ . b. Find  $AB$ .

c. Find  $AB$ . d. Find  $MN$ .

2. Find the measure of  $\angle C$  for the following kites.

a. b.

3. Find the measures of the following the isosceles trapezoids  $KLMJ$ .

$m\angle J$  \_\_\_\_\_  $m\angle L$  \_\_\_\_\_  
 $m\angle M$  \_\_\_\_\_  $m\angle K$  \_\_\_\_\_

4. Name five properties we learned about parallelograms. \_\_\_\_\_

5. Name five properties about rectangles. \_\_\_\_\_

Feb 5-7:11 AM

4. Name three properties of a kite. \_\_\_\_\_

7. Draw a kite  $ABCD$  with  $\angle A = 110^\circ$  and  $\angle C = 90^\circ$ . \_\_\_\_\_

8. Give the most specific name for the quadrilateral. Explain your reasoning.

a. b.

c. d.

9. Show that the quadrilateral with the given vertices is a trapezoid. Then decide whether it is a parallelogram.

a.  $M(-1, 1), N(1, 1), O(1, -1), P(-1, -1)$

b.  $P(-1, 1), Q(1, 1), R(1, -1), S(-1, -1)$

Feb 5-7:12 AM

HW Pg 403 3-18, 21-28

TEST in 2 classes!