Chapter 8: Quadrilaterals
Study Guide

Name: _____
Block: 1 2 3 4 5 6 7 8

SOL G.9
SOL G.10

The student will verify characteristics of quadrilaterals and use properties of quadrilaterals to solve real-world problems
The student will solve real-world problems involving angles of polygons.

Block / Date	Section and Objectives	Classwork and Homework
1	**8.1 Find Angle Measures in Polygons** • Construct all possible diagonals from a given vertex in a polygon • Find the sum of the measures of the angles in a convex polygon • Know and apply the Polygons Interior Angles Theorem • Know that the sum of the measures of the interior angles of a quadrilateral is 360° • Find the number of sides of a polygon when given the sum of the interior angles • Determine the measure of an unknown interior angle for a quadrilateral • Know and apply the Polygon Exterior Angles Theorem • Find the interior angle measures in a regular polygon • Know the names for polygons with 3-10 sides, as well as 12, 20, and n sides	● AIMS Inside Job ● Gizmo: Polygon Angle Sum ● WS Practice 8.1 ● Activity 3: Find Missing Angle Measures ● Activity 4: Algebra and Polygon Angle Sums ● Activity 6:Processing Exterior Angle Sum ● Activity 7: Regular Polygons, Exterior Angles, and Number of Sides ● WSQ 8-1 ● WSQ 8-2
2	**8.2 Use Properties of Parallelograms** • Opposite sides in a parallelogram are congruent and parallel • Opposite angles in a parallelogram are congruent • Consecutive angles in a parallelogram are supplementary • Diagonals of a parallelogram bisect each other **8.3 Show That a Quadrilateral is a Parallelogram** • Know and apply the 5 ways to Prove a Quadrilateral is a Parallelogram (pg. 525)	● WS Practice 8.2 & 8.3 ● Activity 2: Processing the Properties of the Angles of a Parallelogram ● Activity 3: Processing All Properties of Parallelograms ● Activity 4: Am I a Parallelogram? ● Quiz next class on 8.1−8.3 ● WSQ 8-4
3	**8.4 Properties of Rhombuses, Rectangles, and Squares** • Know the definitions and properties for rhombus, rectangle, and square	● Quiz on 8.1−8.3 ● Activity 2: Arithmetic, Algebra, and the Rhombus ● Activity 3: Algebra and Rectangles ● Activity 5: Algebra and Squares ● WSQ 8-5 and 8-6

4	**8.5 Use Properties of Trapezoids and Kites** • Know the definition of a trapezoid • Identify the bases, the base angles, and the legs for a trapezoid • Know the definition of an isosceles trapezoid • Know the properties for an isosceles trapezoid • Define the median/midsegment of a trapezoid • Apply the Midsegment Theorem for Trapezoids • Know the definition of a kite • Know the properties for a kite **8.6 Identify Special Quadrilaterals** • Given information for a shape, determine the type of quadrilateral	● WS Practice 8.5 ● Pre Test ● If you missed the quiz on 8.1-8.3, you will take it today.
5	**Review** • Review Pre Test • Activity 3: Always, Sometimes, Never • Activity 4: Always, Sometimes, Never and Quadrilaterals	● Complete review worksheet!!
6	Test	● Big Quadrilateral Project ● Bigger Quadrilateral Project ● Pg 648 #1-9

Helpful Hints

- Review your notes daily.
- Complete all WSQs and notes in a timely fashion.
- Come to class with specific questions.
- Keep your work nice, neat, and organized.
- Include all drawings and show the work that leads to your solution as you work through these problems. If this is missing, you will not receive any credit on your assessments.

PROPERTIES OF QUADRILATERALS

Name of figure	Diagonals				Angles			Sides		
	Are $\perp$	Are $\cong$	Bisect ea. other	Bisect opp $\angle$s	Opp $\angle$s are $\cong$	Consec $\angle$s are suppl.	Contains 4 right $\angle$s	Contains 4 $\cong$ sides	Opp sides are $\parallel$	Opp sides are $\cong$
Parallelogram										
Rectangle										
Rhombus										
Square										

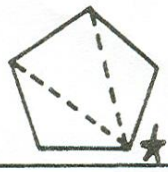
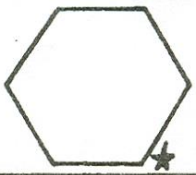
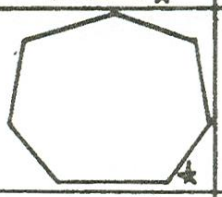
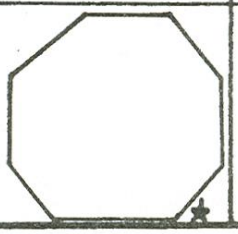
PROPERTIES OF SPECIAL QUADRILATERALS

Name of figure	Diagonals				Angles			Sides		
	Are $\perp$	Are $\cong$	Bisect ea. other	Bisect opp $\angle$s	Opp $\angle$s are $\cong$	Consec $\angle$s are suppl.	Contains 4 right $\angle$s	Contains 4 $\cong$ sides	Opp sides are $\parallel$	Opp sides are $\cong$
Trapezoid										
Isosceles Trapezoid										
Kite										

An Inside Job

Name _____

To find the number of degrees in each inside angle of a regular polygon:
1. Form triangles inside each polygon by drawing diagonals from each ★. Count the triangles. Multiply by 180°.
2. Divide by number of sides in polygon.

Regular Polygon	Number of Triangles	× 180°	÷ Number of Sides	= Degrees in each inside angle of polygon
Equilateral Triangle 				
				
				
				
				
				

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Naming Polygons and Other Information

Number of sides	Type of polygon
3	
4	
5	
6	
7	
8	
9	
10	
12	
20	
n	

Sum of interior angles	Measure each interior angle for regular polygon	Measure of each exterior angle for regular polygon

Other Formulas for Regular Polygons

To Find The…	Use the formula:
Sum of interior angles	
Number of sides given sum of interior angles	
Number of sides and you know the measure of each interior angle	
Sum of exterior angles	
Measure of each interior angle if you know the number of sides	
An exterior angle and you know the measure of each interior angle	
An interior angle and you know the measure of each exterior angle	

Geometry
§8.1

Name_____
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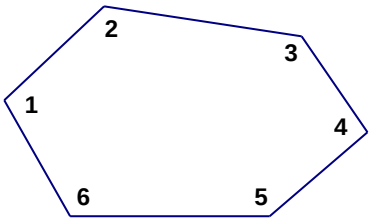
Finding Angle Measures in Polygons

diagonal –

Theorem –



n = 6

Corollary –

Examples:

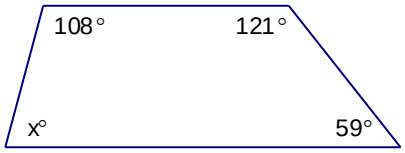
1. Find the sum of the measures of the interior angles of a convex octagon.

2. The sum of the measures of the interior angles of a convex polygon is 900°.
Classify the polygon by the number of sides.

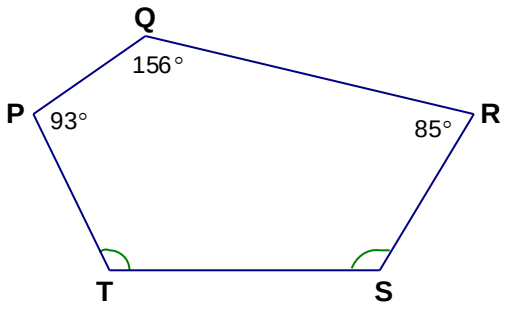
3. A coin is in the shape of a regular 11-gon. Find the sum of the measures of the interior angles.

4. The sum of the measures of the interior angles of a convex polygon is 1440°.
Classify the polygon by the number of sides.

5. Find the value of x in the diagram shown.



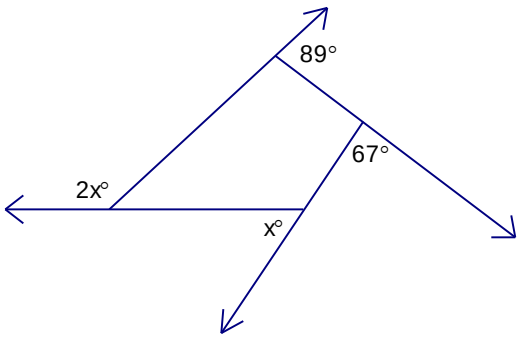
6. Use the diagram to find $\angle S$ and $\angle T$.



7. The measures of three of the interior angles of a quadrilateral are 89°, 110°, and 46°. Find the measure of the fourth interior angle.

Theorem –

8. What is the value of x in the diagram?



9. A convex hexagon has exterior angles with measures 34°, 49°, 58°, 67°, and 75°. What is the measure of an exterior angle at the sixth vertex?

Geometry
WS Practice 8.1

Name_____
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Find the sum of the measures of the interior angles of the indicated convex polygon.

1. hexagon

2. dodecagon

3. 11-gon

4. 15-gon

5. 20-gon

6. 40-gon

The sum of the measures of the interior angles of a convex polygon is given. Classify the polygon by the number of sides.

7. 180°

8. 540°

9. 900°

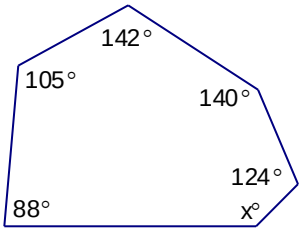
10. 1800°

11. 2520°

12. 3960°

Find the value of x.

16.



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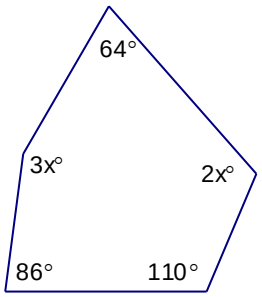

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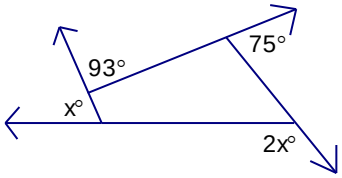

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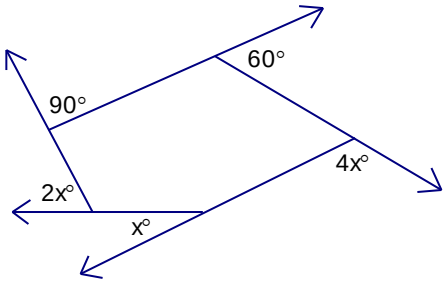


20. The measures of the exterior angles of a convex quadrilateral are 90°, 10x°, 5x°, and 45°. What is the measure of the largest exterior angle?

21. The measures of the interior angles of a convex octagon are 45x°, 40x°, 155°, 120°, 155°, 38x°, 158°, and 41x°. What is the measure of the smallest interior angle?

Find the measures of an interior angle and an exterior angle of the indicated polygon.

22. regular triangle **23.** regular octagon **24.** regular 16-gon

Find the value of n for each regular n-gon described.

25. Each interior angle of the regular n-gon has a measure of 140°.

26. Each interior angle of the regular n-gon has a measure of 175.2°

Geometry
§8.2-8.3

Name_____
Date_____ Pd_____

Parallelograms

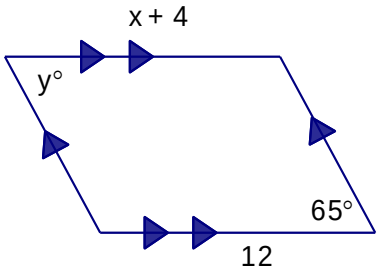
parallelogram –

If a quadrilateral is a parallelogram, then:

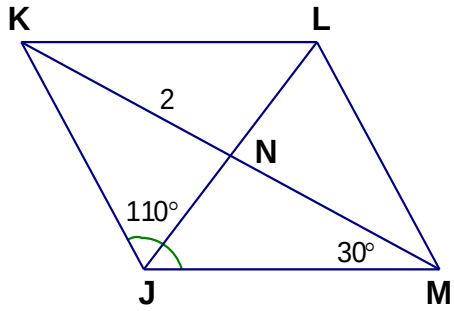
- _____
- _____
- _____
- _____

Examples:

1. Find the values of x and y.



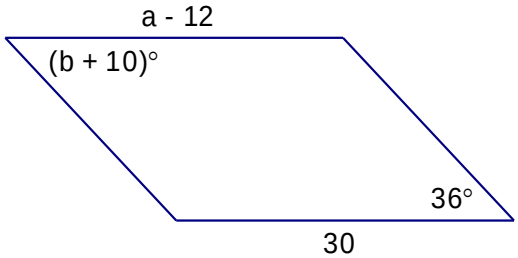
2. Find the indicated measure given the JKLM is a parallelogram.



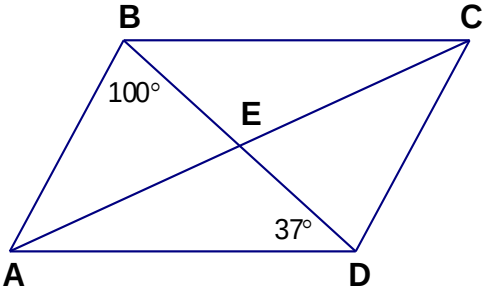
a. NM **b.** KM

c. m∠JML **d.** m∠KML

3. Find the values of a and b in the parallelogram.



4. Find the indicated measures in parallelogram ABCD.



a. m∠BCD

b. If BE = 9, find BD.

How do I know if a quadrilateral is a parallelogram?

If....

- both pairs of _____

- both pairs of _____

- both pairs of _____

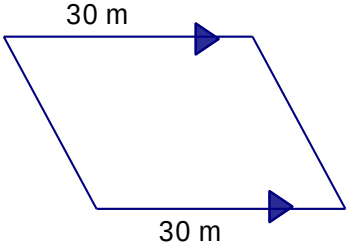
- one pair _____

- the diagonals of _____

Examples:

What reasoning can you use to show that the quadrilateral is a parallelogram?

1.



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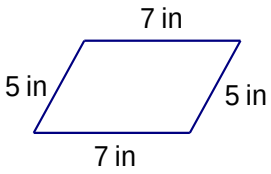

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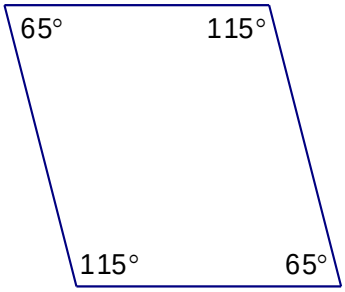
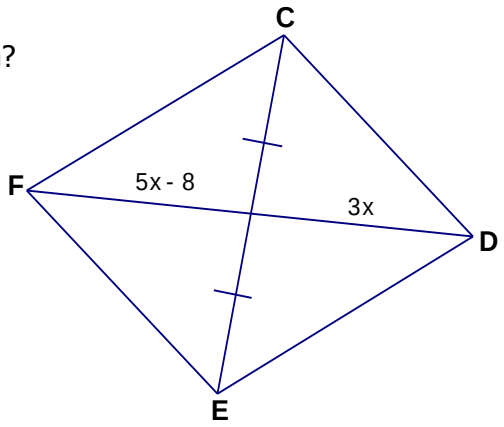


4. For what value of x is quadrilateral CDEF a parallelogram?



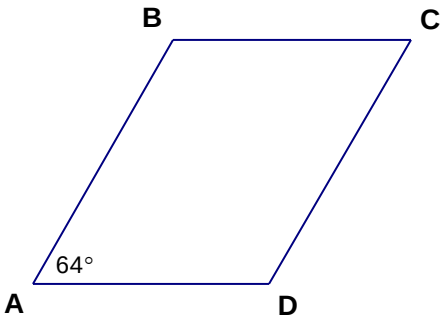
5. In quadrilateral WXYZ, m∠W = 42°, m∠X = 138°, m∠Y = 42°. Find m∠Z. Is WXYZ a parallelogram?

Geometry
WS Practice 8.2 & 8.3

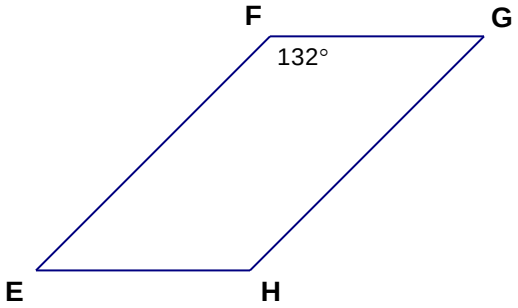
Name_____
Date_____ Pd_____

Find the measure of the indicated angle in the parallelogram.

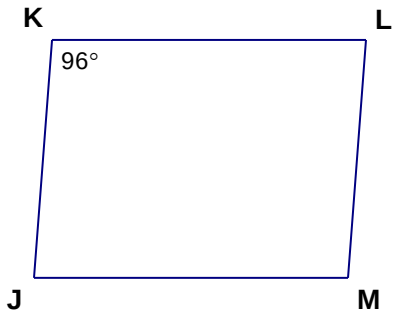
1. Find m∠B.



2. Find m∠G.

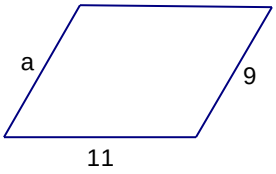


3. Find m∠M.



Find the value of each variable in the parallelogram.

4.



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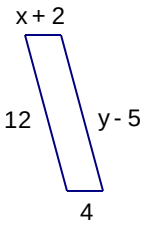

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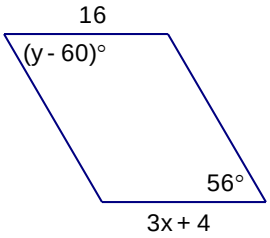

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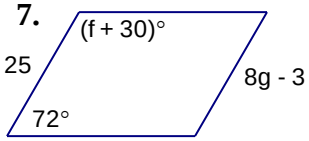

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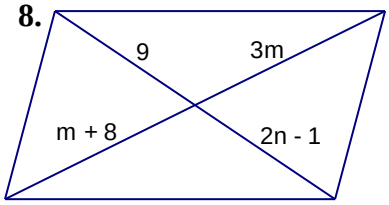

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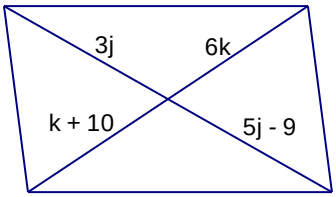
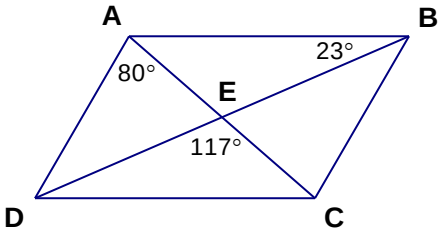


Find the indicated measure in ▱ABCD.

10. m∠AEB

11. m∠BAE



12. m∠AED

13. m∠ECB

14. m∠BAD

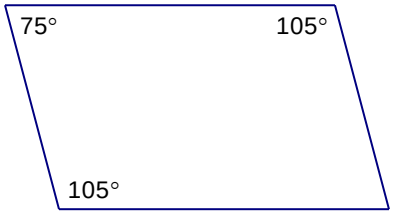
15. m∠DCE

16. m∠ADC

17. m∠DCB

What theorem can you use to show that the quadrilateral is a parallelogram?

18.



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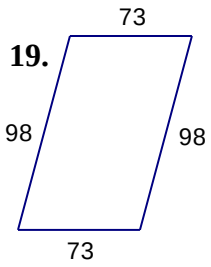

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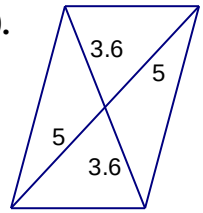

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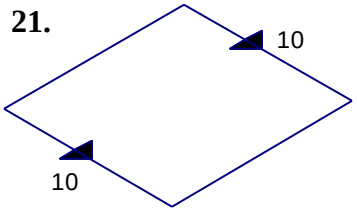
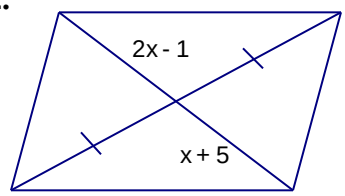


For what value of x is the quadrilateral a parallelogram?

22.



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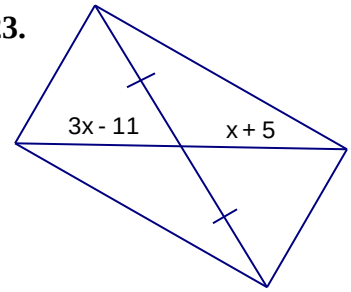

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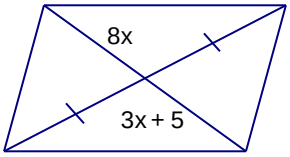

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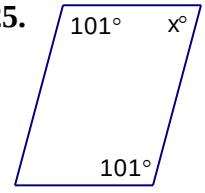

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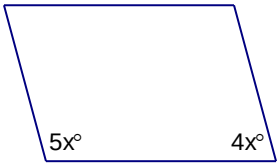

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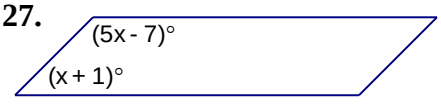


Geometry
§8.4

Name_____
Date_____ Pd_____

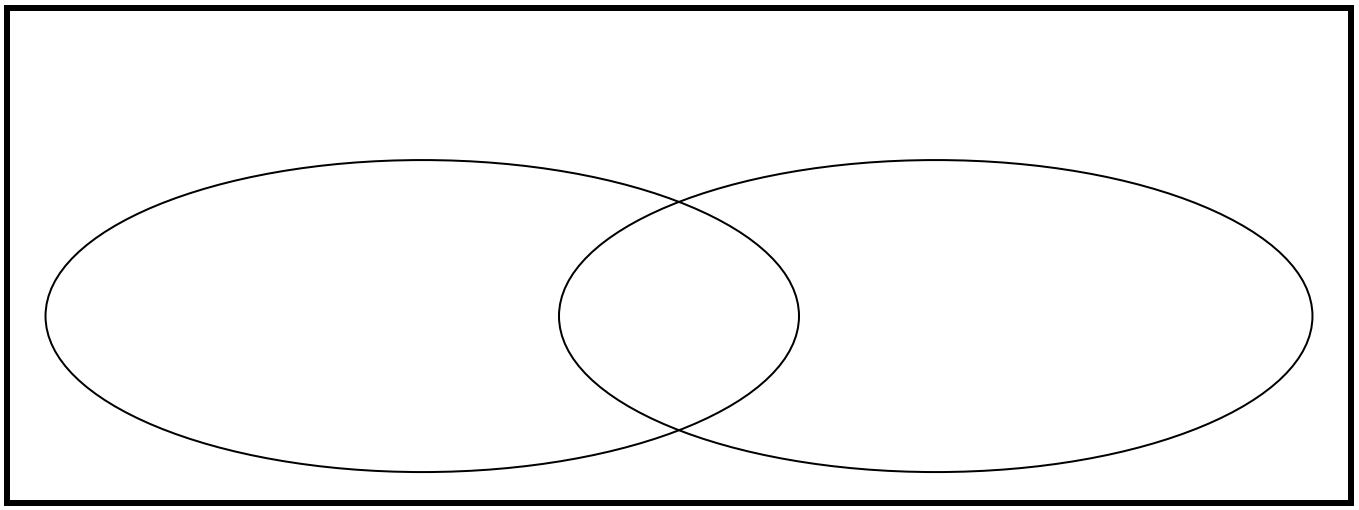
Rhombuses, Rectangles, and Squares

rhombus –

rectangle –

square –

See pg. 534



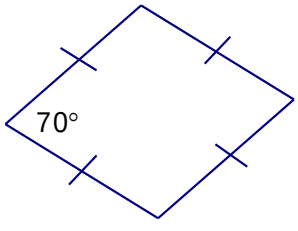
Examples:

1. For any rhombus QRST, decide whether the statement is **always** or **sometimes** true.

a. $\angle Q \cong \angle S$

b. $\angle Q \cong \angle R$

2. Classify the special quadrilateral. Explain your reasoning.



Theorems about Diagonals

Pg. 535

A parallelogram is a rhombus if and only if…

A parallelogram is a rhombus if and only if…

A parallelogram is a rectangle if and only if…

3. Sketch rectangle ABCD. List **everything** you know about it.

Geometry
§8.5-8.6 Trapezoids & Kites / Special Quadrilaterals

Name_____
Date_____ Pd_____

trapezoid –

bases –

legs –

isosceles trapezoid –

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

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

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

The Midsegment –

<u>Midsegment Characteristics:</u>

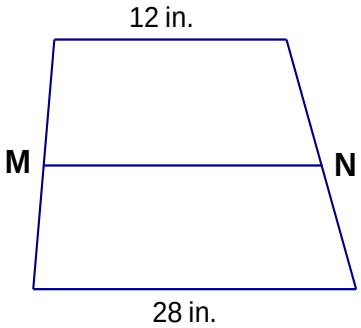
1)

2)

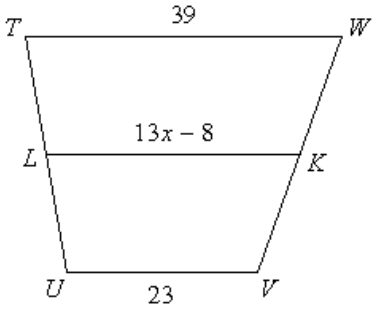
3)

<u>Example:</u> Finding the length of the midsegment in trapezoids.

1.

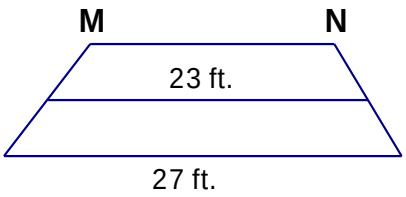


2.



Example: Finding the length of the base in trapezoids.

3.



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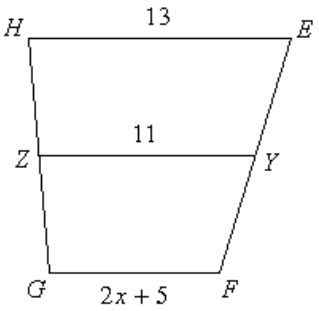
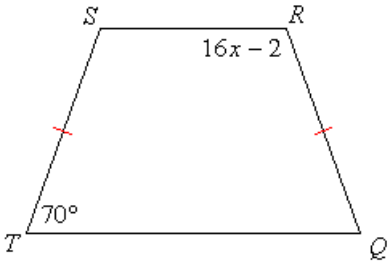
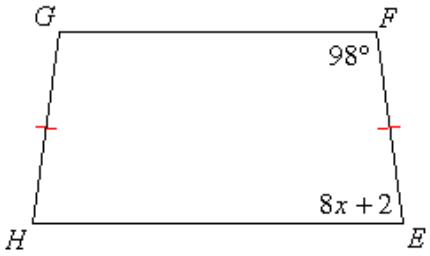


Example: Finding angle measurements in trapezoids.

5.



6.



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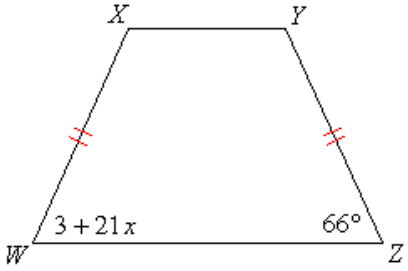


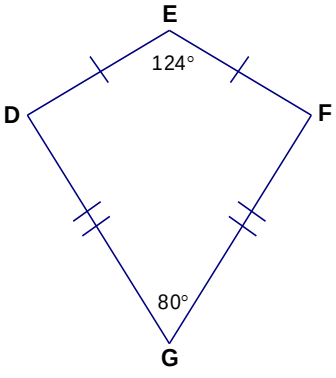
Kite –

<u>Kite Characteristics:</u>

1)

2)

3. Find m∠D in the kite shown at the right.



Quadrilateral Family Tree **Quadrilateral Venn Diagram**

Always, Sometimes, or Never?

1)	Is a square a rectangle?	Always	Sometimes	Never
2)	Is a rectangle a square?	Always	Sometimes	Never
3)	Is a trapezoid an isosceles trapezoid?	Always	Sometimes	Never
4)	Is a rectangle a kite?	Always	Sometimes	Never

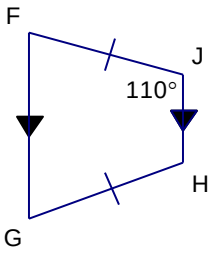
Summarize in your own words:

Geometry
WS Practice 8.5

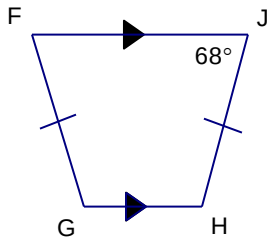
Name_____
Date_____ Pd_____

Find m∠F, m∠G, and m∠H.

1.

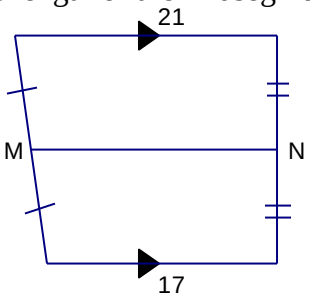


2.



Find the length of the midsegment of the trapezoid.

3.



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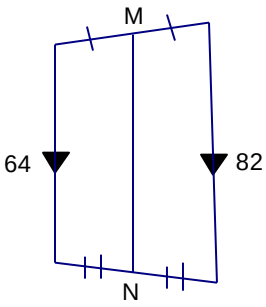
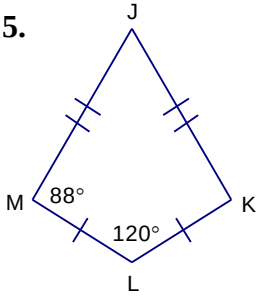


JKLM is a kite. Find m∠K.

5.



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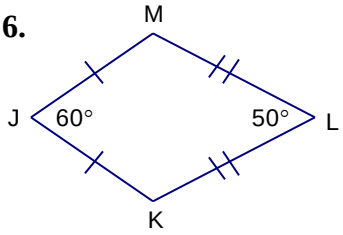
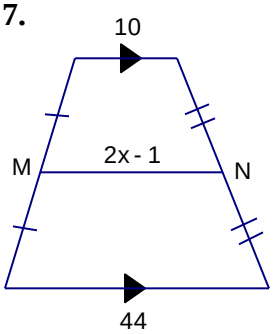


Find the value of x.

7.



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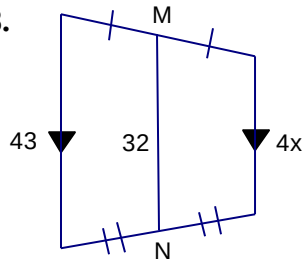

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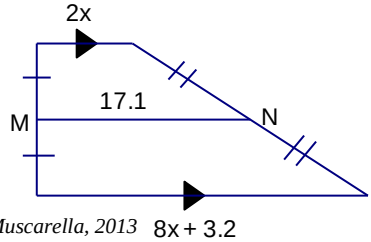

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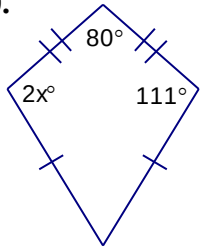
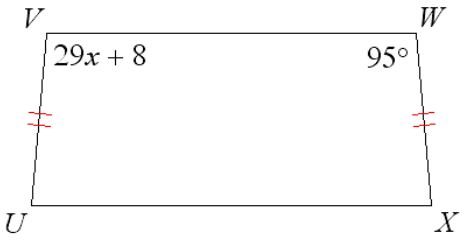


11. You cut out a piece of fabric in the shape of a kite so that the congruent angles of the kite are 100° each. Of the remaining two angles, one is 4 times larger than the other. What is the measure of the largest angle in the kite?

Find the value of x.

12.



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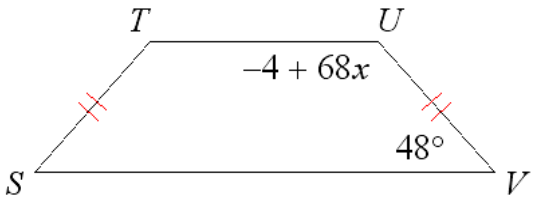

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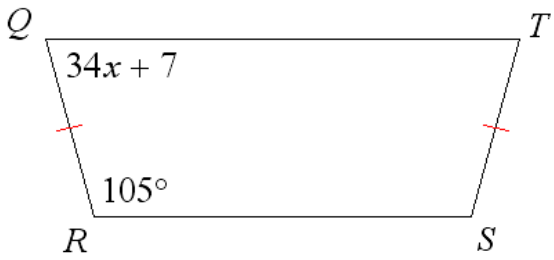

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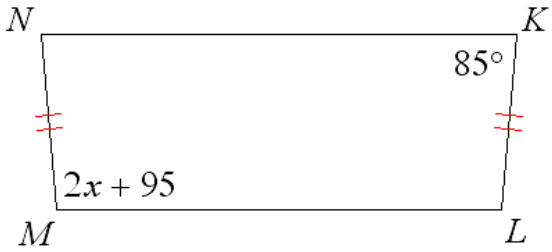


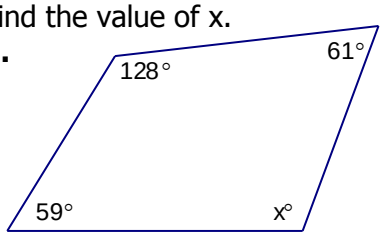
Geometry
Ch.8 Pretest

Name_____
Date_____ Pd_____

SHOW ALL WORK!!

Find the value of x.

1.



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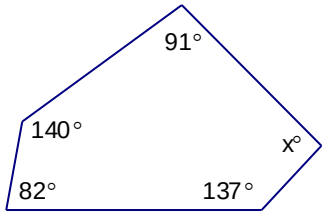

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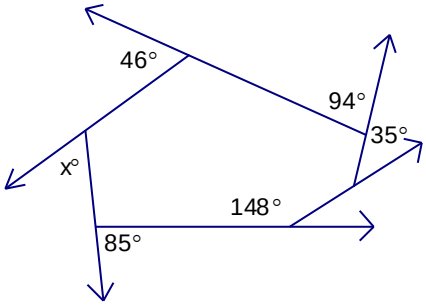

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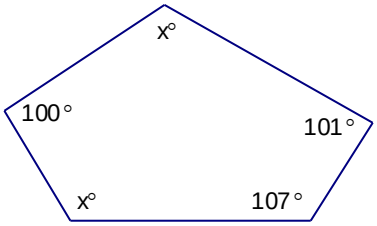
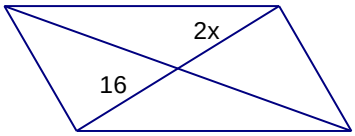


Find the value of each variable in the parallelogram.

5.

6.



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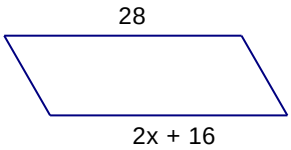

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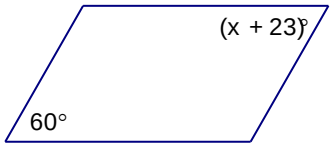
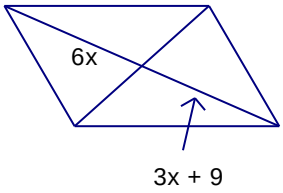


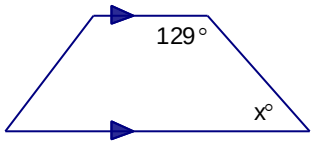
9.



10.

Find the value of x.

11.



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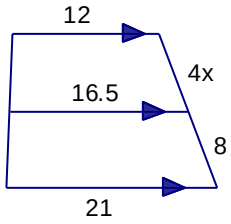

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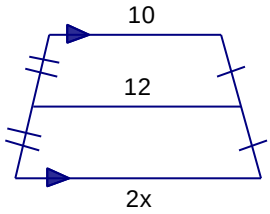

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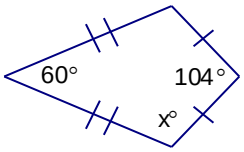
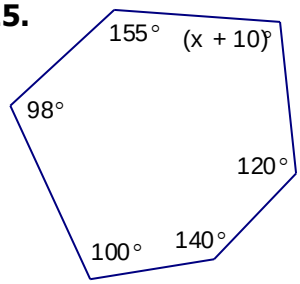


Find the value of x.

15.



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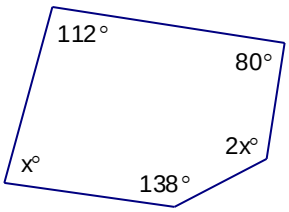

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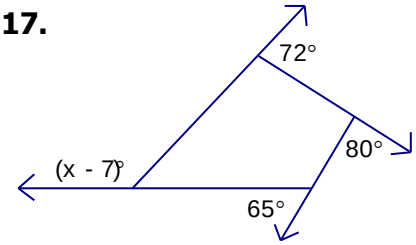

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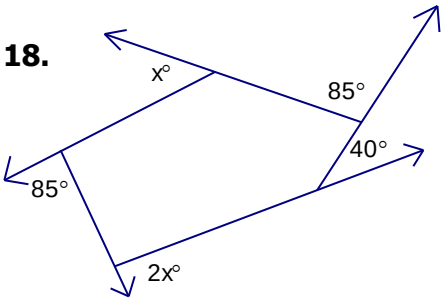


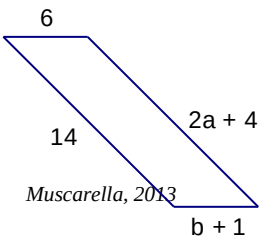
Find the measure of an interior angle and an exterior angle of the indicated regular polygon.

19. hexagon

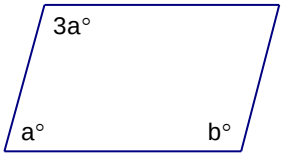
20. nonagon

Find the value of each variable.

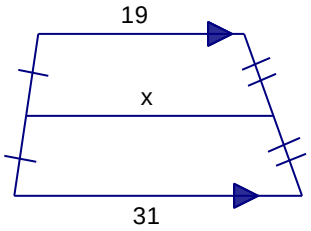
21.



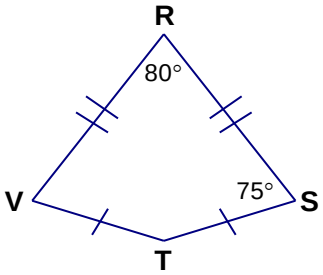
22.



23. Find the value of x.



24. RSTV is a kite. Find m∠V.



25. Name two properties….

- about a parallelogram

- about a rectangle

- about a rhombus

- about an isosceles trapezoid