

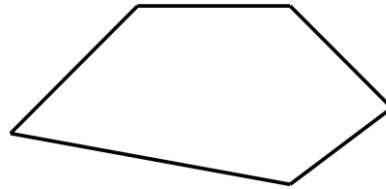
UNIT 7 – Quadrilaterals Notes

Name: _____ Per: _____

Polygons Basics----Day 1

Objectives: SWBAT identify, name and describe polygons.
SWBAT use the sum of the measures of the interior angles of a quadrilateral.

The basics on POLYGONS

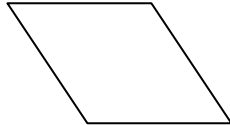


State whether the following figures are polygons or not.

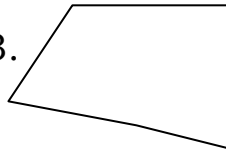
1.



2.



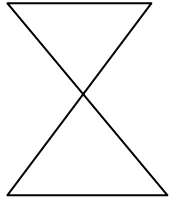
3.



4.



5.



Naming Polygons

of Sides Type of polygon

3

Triangle

4

Quadrilateral

5

Pentagon

6

Hexagon

7

Heptagon

8

Octagon

9

Nonagon

10

Decagon

11

Hendecagon

12

Dodecagon

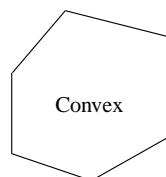
N

n-gon

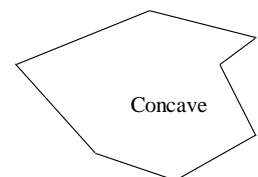
Convex vs. Concave

Convex –

Concave-



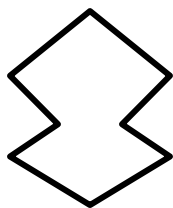
Convex



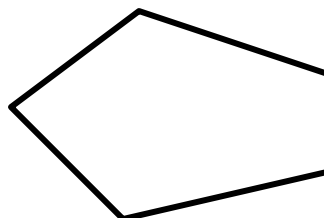
Concave

Examples: Identify the polygon and state whether it is convex or concave.

1.



2.

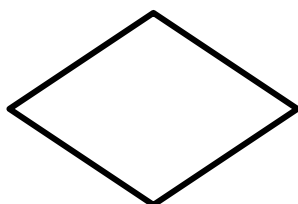


Regular Polygons

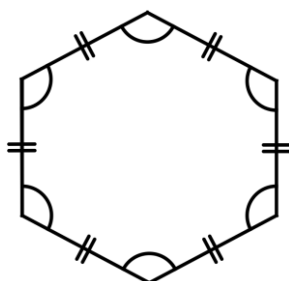
Examples:

Decide whether the polygon is regular, explain why or why not.

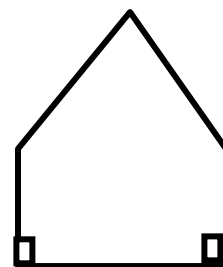
1.



2.

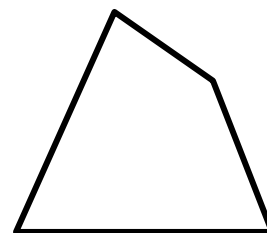


3.

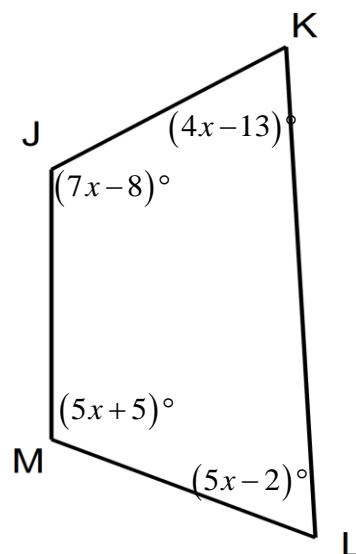
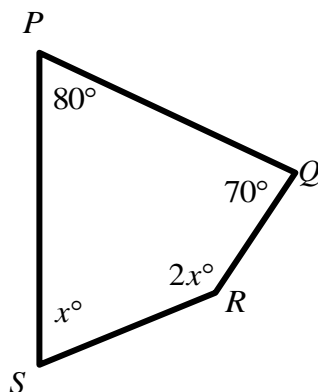


Interior Angles of Polygon Theorem

Quadrilaterals



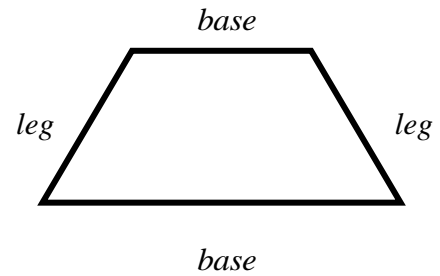
Examples: Find the value of x



Trapezoids and Kites---Day 2

Objectives: SWBAT use properties of trapezoids and kites.

Trapezoids

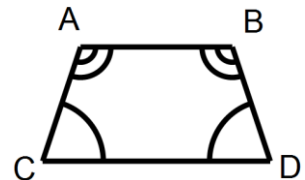


Isosceles Trapezoid

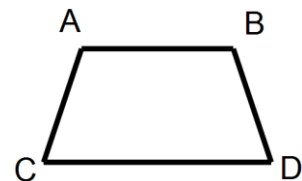


Isosceles Trapezoid Angle Theorem

Converse of the Isosceles Trapezoid Angle Theorem



Isosceles Trapezoid Diagonals Theorem



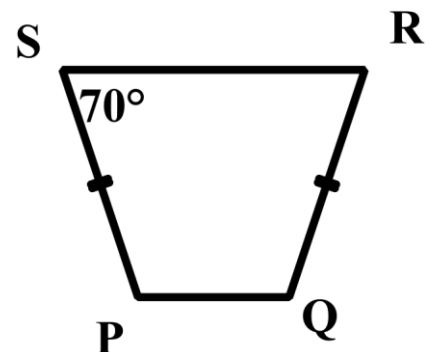
Examples:

PQRS is an isosceles trapezoid.

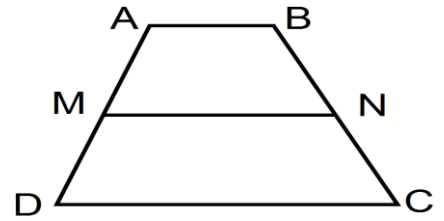
Find $m\angle P$:

Find $m\angle Q$:

Find $m\angle R$:

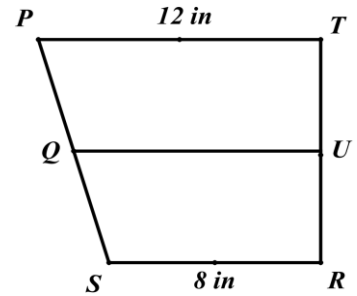


Midsegment of a Trapezoid



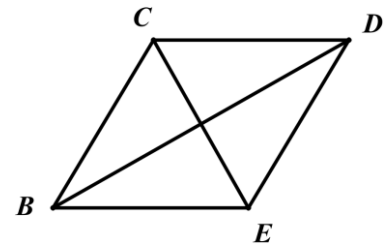
3. M and N are the midpoints on PS and QR, respectively.

Find the length of the midsegment.

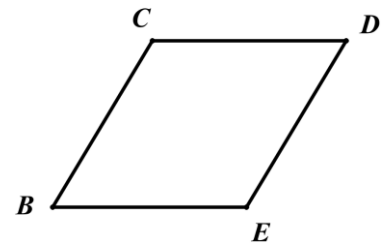


KITE

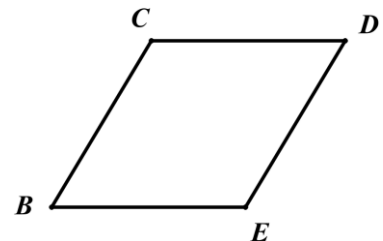
Kite's Perpendicular Diagonals Theorem



Kite Opposite Angle Theorem



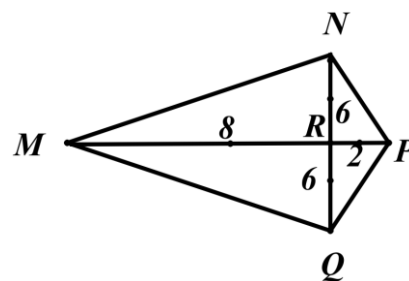
Sides of a Kite Theorem



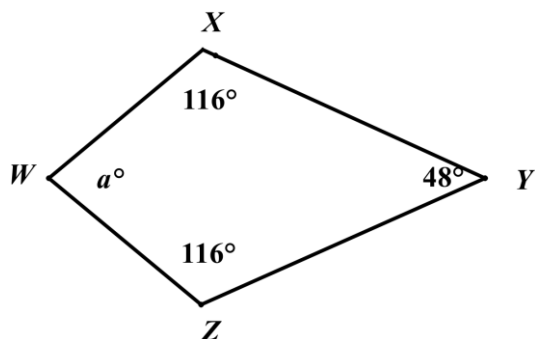
Examples:

1. MQNP is a kite (so the diagonals are perpendicular).

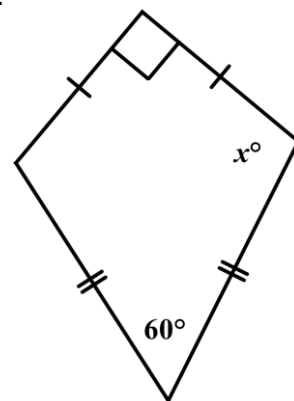
Find MN, NQ, NP, PQ, and the Perimeter



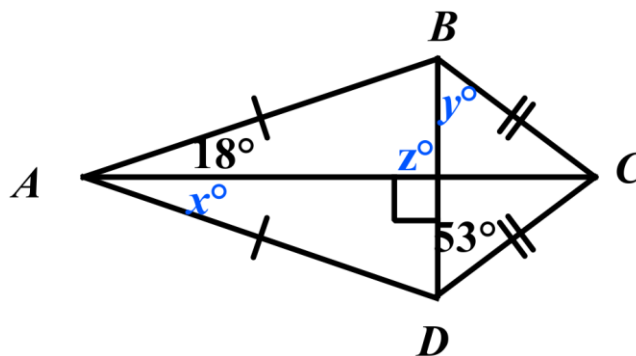
2. Find a.



3. Find x



a. Find x , y, and z.

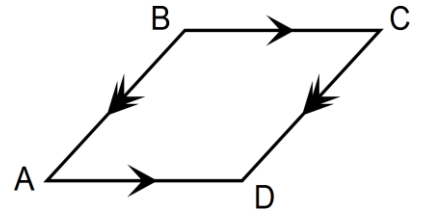


The diagonal \overline{RB} of kite $RHBW$ forms an equilateral triangle with two of the sides, and $m\angle BWR = 40$. Draw and label a diagram showing the diagonals, and the measures of all the angles.

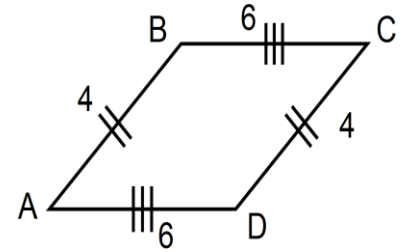
Properties of Parallelograms---Day 3

Objectives: SWBAT use properties of parallelograms in real-life situations.

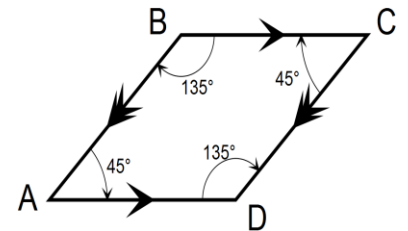
Parallelogram~



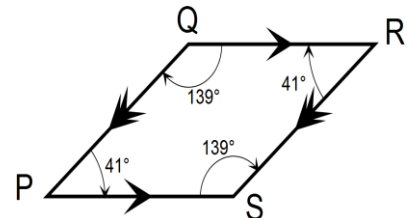
Opposite Side Parallelogram Theorem



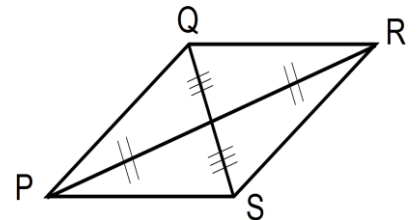
Opposite Angles Parallelogram Theorem



Consecutive Angles Parallelogram Theorem



Diagonals of a Parallelogram Theorem

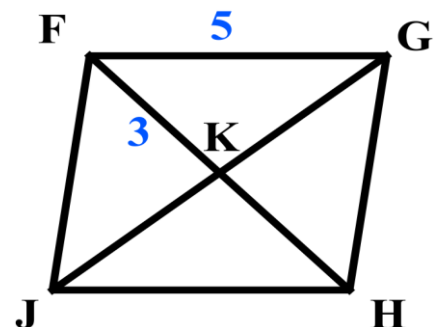


Examples:

1. FGHJ is a parallelogram. Find the unknown lengths.

a. JH

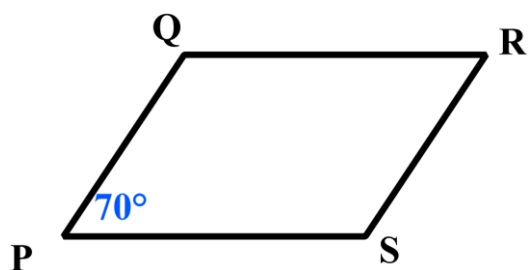
b. FH



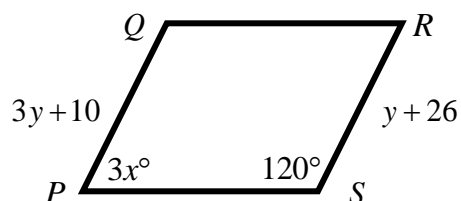
2. Find the angle measures.

a. $m\angle R$

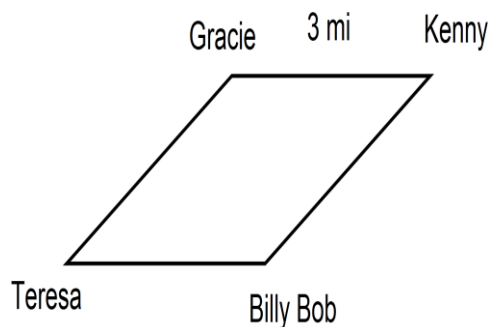
b. $m\angle Q$



3. Find the value of x and y .



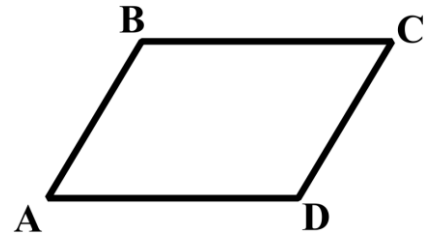
4. Gracie, Kenny, Teresa, and Billy Bob live at the four corners of a block shaped like a parallelogram. Gracie lives 3 miles away from Kenny. How far apart do Teresa and Billy Bob live from each other?



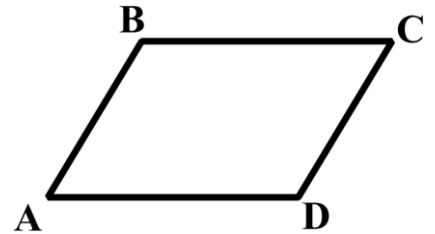
Proving Quadrilaterals are Parallelograms---Day 4

Objectives: SWBAT prove that a quadrilateral is a parallelogram.

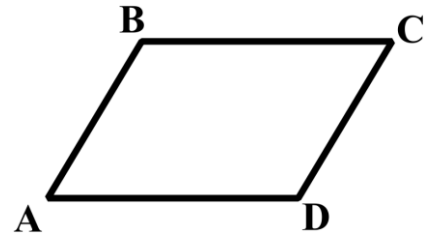
Definition of Parallelogram



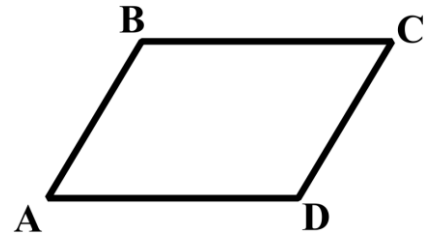
Converse Opposite Side Parallelogram Theorem



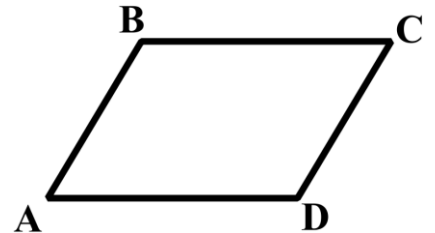
Converse Opposite Angle Parallelogram Theorem



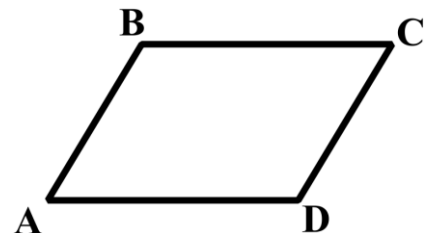
Converse Consecutive Angles Parallelogram Theorem



Converse Diagonals of a Parallelogram Theorem

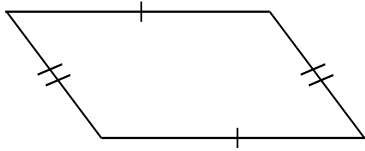


Parallel and Congruent Parallelogram Theorem

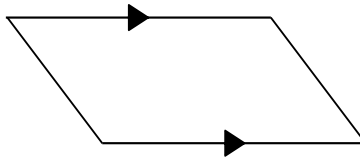


Examples: Determine if the following quadrilaterals are parallelograms. If so why or why not?

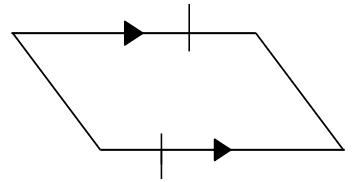
1.



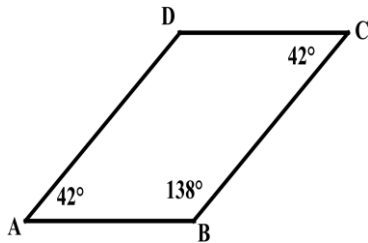
2.



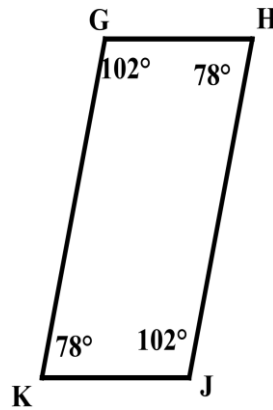
3.



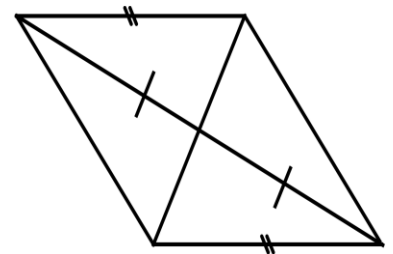
4.



5.

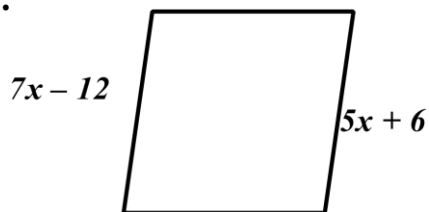


6.

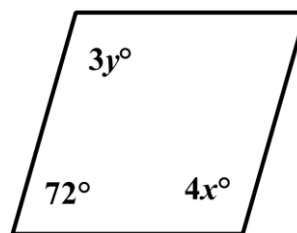


Solve for the following variables so that the quadrilateral is a parallelogram.

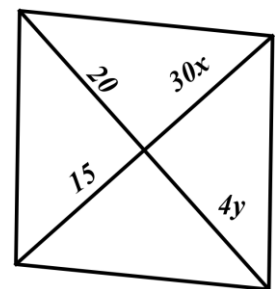
7.



8.



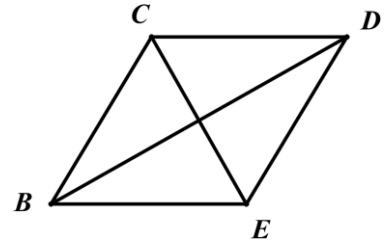
9.



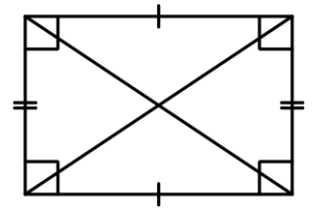
Rhombuses and Rectangles---Day 5

Objectives: SWBAT use properties of sides and angles of rhombuses and rectangles
SWBAT use properties of diagonals of rhombuses and rectangles

Rhombus~



Rectangle~



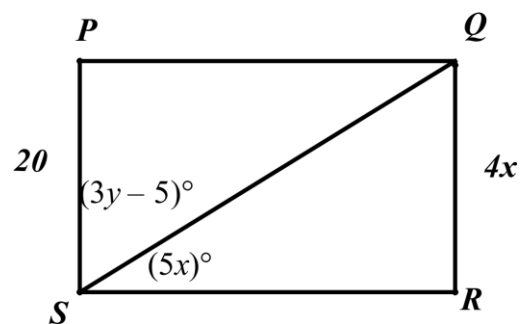
True or false, if false explain why it is false.

1. A rectangle is a parallelogram.
2. A parallelogram is always a rhombus.
3. A rhombus is always a Rectangle.
4. A rhombus is always a Kite.
5. A rhombus is always a parallelogram.

Matching: Which of the following quadrilaterals has the given property?

- | | |
|--|------------------|
| 6. All sides are congruent. | A. Parallelogram |
| 7. All angles are congruent. | B. Rectangle |
| 8. The diagonals are congruent. | C. Rhombus |
| 9. Opposite angles are congruent. | D. Quadrilateral |
| 10. Sum of Interior angles equals 360 degrees. | |

11. What is the value of x and y in the rectangle to the right?



12. Use the rhombus PRYZ, to find the measurements of the following given that

$$\begin{aligned} PK &= 4y + 1 \\ KY &= 7y - 14 \end{aligned}$$

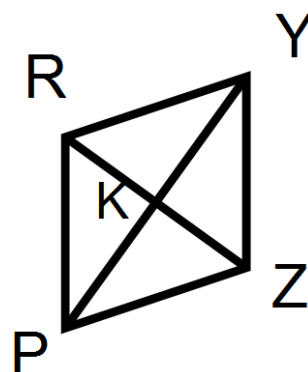
$$\begin{aligned} RK &= 3x - 1 \\ KZ &= 2x + 6 \end{aligned}$$

A) PY

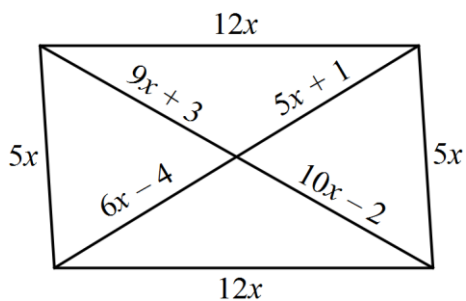
B) RZ

C) $m\angle YKZ$

D) YZ



13. Based on the figure below, which statements are true?



I. The figure is a rectangle

II. The figure is a parallelogram

III. $6x - 4 = 9x + 3$

IV. $9x + 3 = 10x - 2$

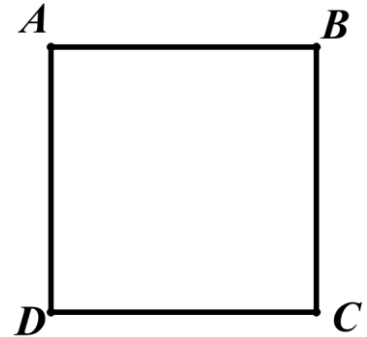
V. $x = 8$

VI. The longest side has a length of 60.

Squares---Day 6

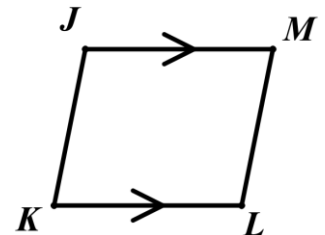
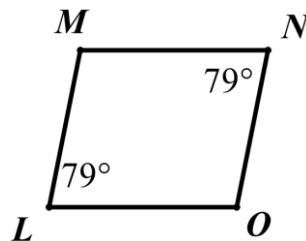
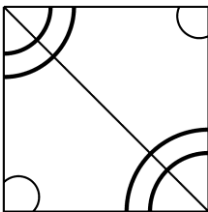
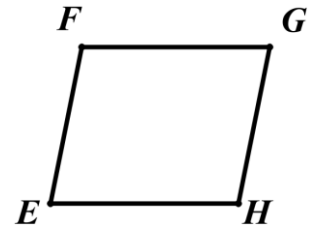
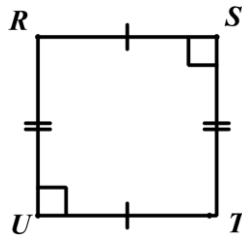
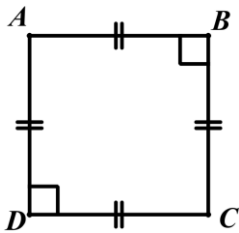
Objectives: SWBAT use properties of sides and angles of Squares
SWBAT use properties of diagonals of Squares

Square

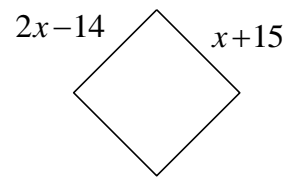


Examples:

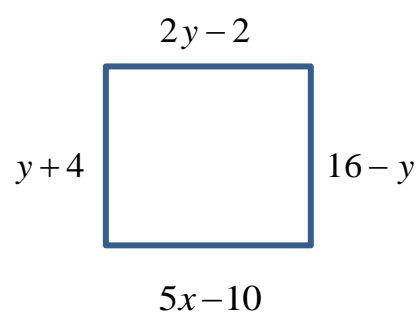
Identify each figure as a quadrilateral, parallelogram, rhombus, rectangle, trapezoid, kite, square or none of the above.



1. Given that the figure to the right is a square, find the length of a side.



2. The quadrilateral at the below is a square. Solve for x and y .



$$x = \underline{\hspace{2cm}}$$

$$y = \underline{\hspace{2cm}}$$

3. Given Square SQR, find the following.

$$EQ =$$

$$m\angle SEQ =$$

$$EU =$$

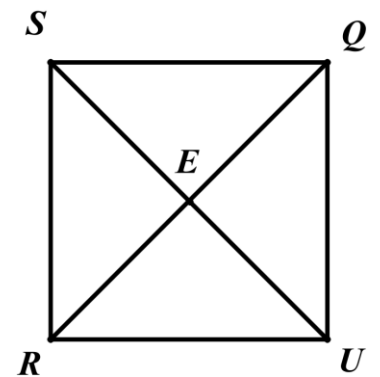
$$m\angle SQU =$$

$$SU =$$

$$m\angle UEQ =$$

$$RU =$$

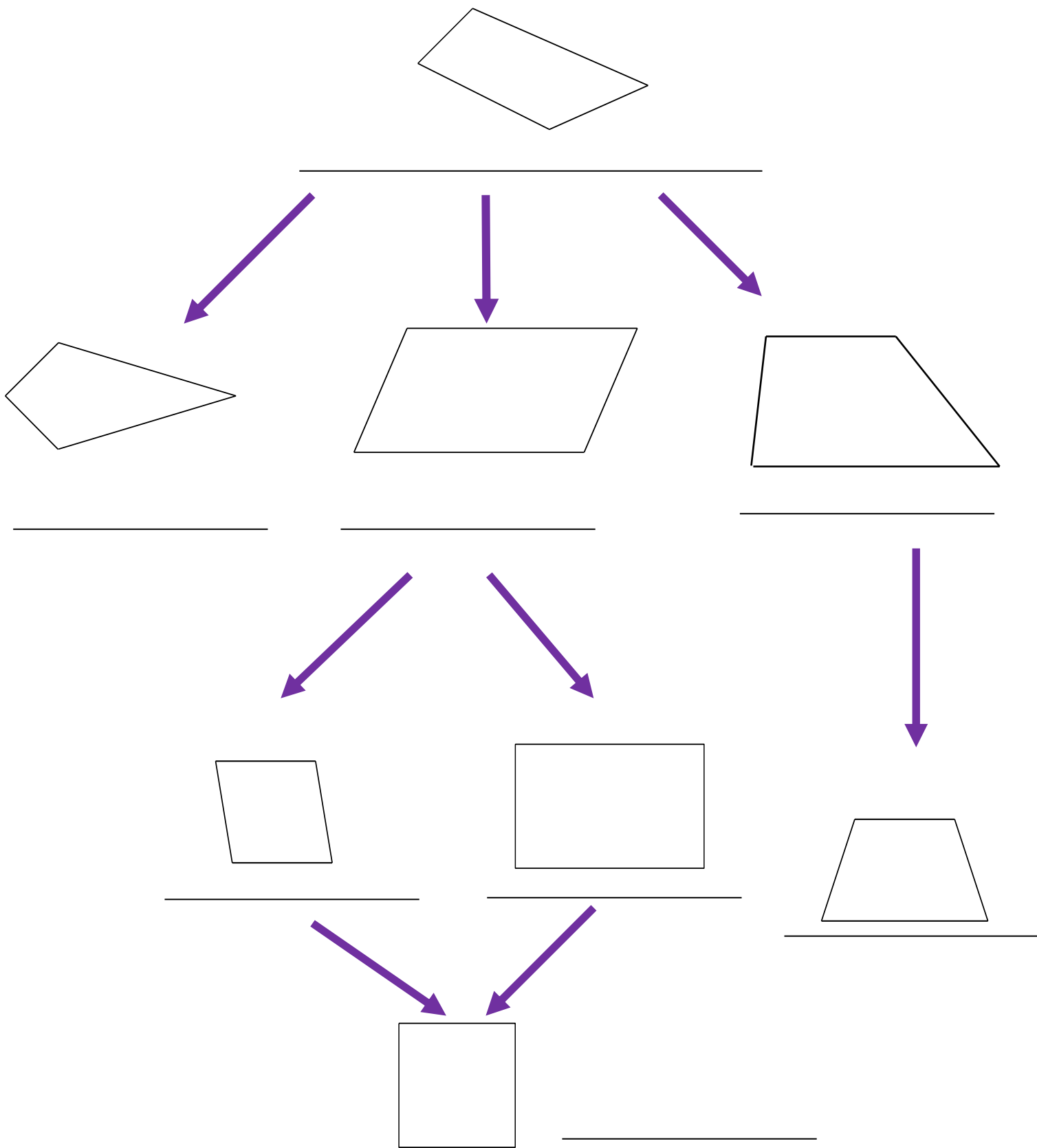
$$m\angle SQE =$$

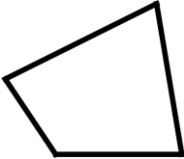
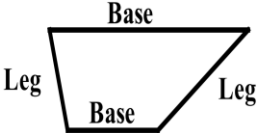
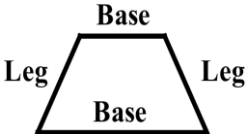
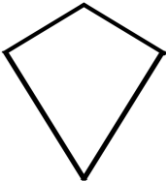



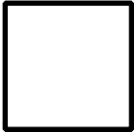


$$RE = 16 \text{ mm.}$$

Quadrilateral Family Tree---Day 7

Objectives: SWBAT identify special quadrilaterals.



Shape		Description of Sides	Description of Angles	Interesting Information
Quad				
Trapezoid				
Isosceles Trapezoid				
Kite				
Parallelogram				
Rectangle				
Rhombus				
Square				

Fill in the table. Put an **X** in the box if the shape *always* has the property.

Property	Parallelogram	Rectangle	Rhombus	Square	Trapezoid
Both pairs of opp. sides \parallel					
Exactly 1 pair of opp. sides \parallel					
Diagonals are \perp					
Diagonals are \cong					
Diagonals bisect each other					

Quadrilateral ABCD has *at least* one pair of opposite sides congruent. Draw the kinds of quadrilaterals meet this condition (5).

COORDINATE QUADS---Day 8

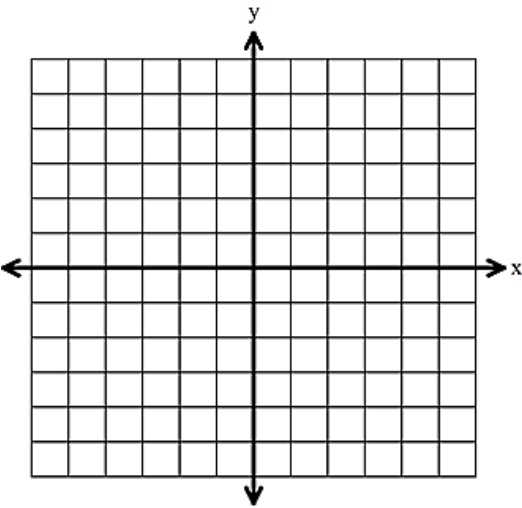
Objectives: SWBAT identify types of quads using a coordinate plane.

Characteristic	Definition	Formula
Congruent		
Perpendicular		
Parallel		
Midsegment / Midpoint		

Coordinate Proof

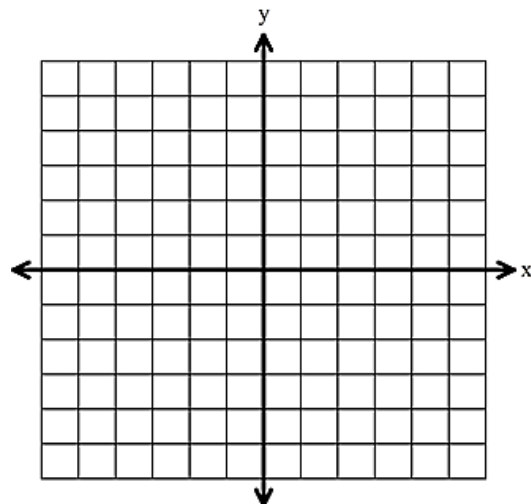
1. Use the coordinate plane, and the *Distance Formula* to show that KLMN is a Rhombus.

K(2, 5), L(-2, 3), M(2, 1), N(6, 3)



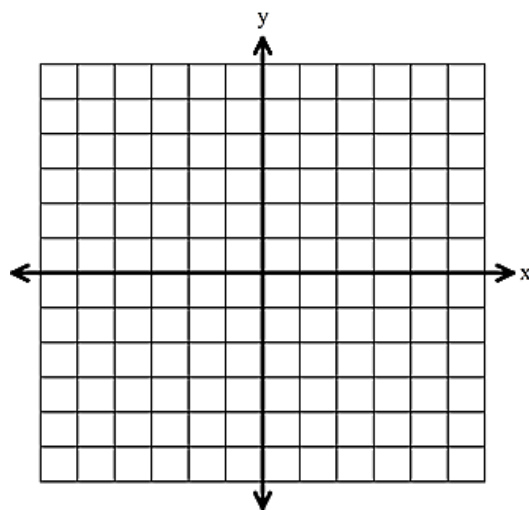
2. Use slope or the distance formula to determine the most precise name for the figure $A(-1, -4), B(1, -1), C(4, 1), D(2, -2)$.

- A. Kite
- B. Rhombus
- C. Trapezoid
- D. Square



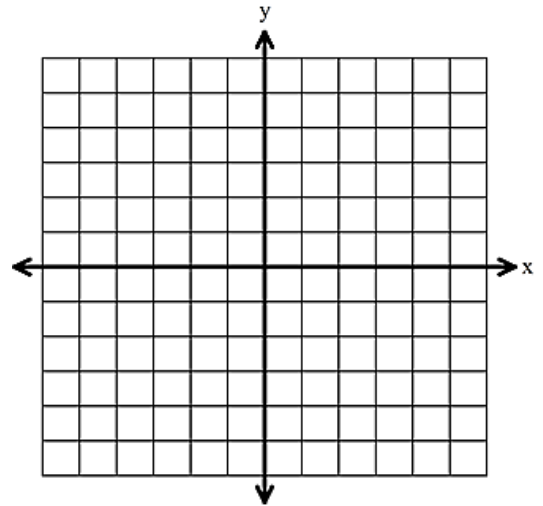
3. Given points $B(-3, 3), C(3, 4)$, and $D(4, -2)$. Which of the following points must be point A in order for the quadrilateral $ABCD$ to be a parallelogram?

- A. $A(-2, -1)$
- B. $A(-1, -2)$
- C. $A(-2, -3)$
- D. $A(-3, -2)$



4. Given a Trapezoid $A(-3,4)$, $B(-5,-2)$, $C(5,-2)$, and $D(3,4)$. Find the following

- a) Is the trapezoid Isosceles?
- b) What are coordinates of the midsegment for the trapezoid?
- c) What is the length of the midsegment?



Classifying Quadrilaterals

