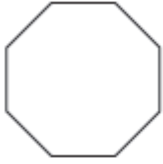


**Math 2 Unit 5 Worksheet 1**  
**Polygon Angle-Sum Theorems**

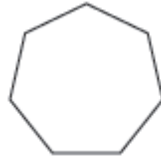
Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Per: \_\_\_\_\_

[1-3] Find the sum of the angle measures of each polygon.

1.



2.



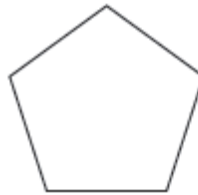
3. 12-gon

[4-6] Find the measure of one angle in each regular polygon. Round to the nearest tenth if necessary.

4.



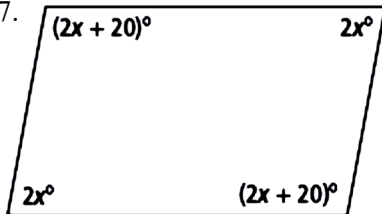
5.



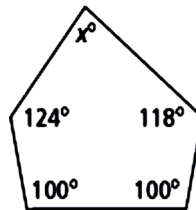
6. regular 15-gon

[7-9] Find the missing angle measures.

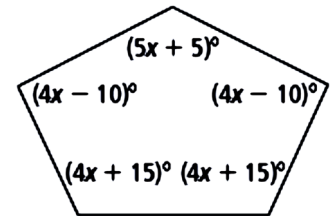
7.



8.



9.



[10-12] Find the measure of an EXTERIOR angle of each REGULAR polygon. Round to the nearest tenth if necessary.

10. Decagon

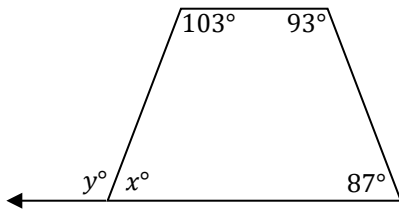
11. 16-gon

12. hexagon

[13-15] Find the value of each variable.

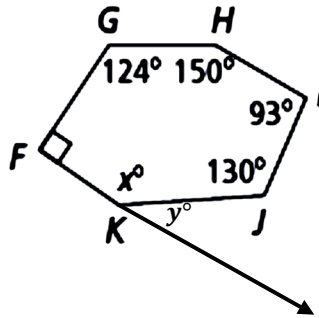
13.  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_



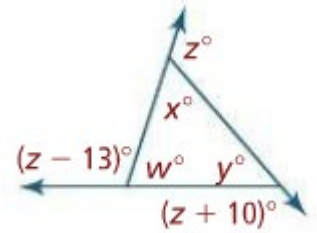
14.  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_



15.  $w =$  \_\_\_\_\_  $y =$  \_\_\_\_\_

$x =$  \_\_\_\_\_  $z =$  \_\_\_\_\_



[16-18] The measure of an EXTERIOR angle of a REGULAR polygon is given. Find the measure of an INTERIOR angle. Then find the NUMBER OF SIDES.

16.  $120^\circ$

17.  $18^\circ$

18.  $12^\circ$

Interior Angle: \_\_\_\_\_

Interior Angle: \_\_\_\_\_

Interior Angle: \_\_\_\_\_

Number of Sides: \_\_\_\_\_

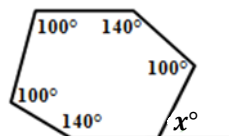
Number of Sides: \_\_\_\_\_

Number of Sides: \_\_\_\_\_

19. A regular polygon has an interior angle with a measure of  $150^\circ$ . How many sides does the polygon have?

20. A regular polygon has an interior angle with a measure of  $175^\circ$ . How many sides does the polygon have?

21. Find the value of  $x$ . Drawing is not to scale.



**Math 2 Unit 5 Worksheet 2**  
**Properties of Parallelograms**

**Name:** \_\_\_\_\_  
**Date:** \_\_\_\_\_ **Per:** \_\_\_\_\_

[1-5] The given figures are all parallelograms. Solve for the variable(s) in each diagram, then state the property of parallelograms that allowed you to solve for the variable(s).

1.



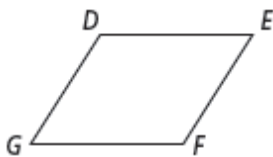
$x =$  \_\_\_\_\_

Property: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2.  $DG = 2x + 2$ ,  $DE = 3x + 1$ ,  $EF = 3x - 3$ ,  $GF = 2x + 6$



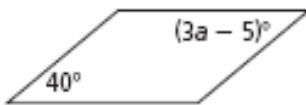
$x =$  \_\_\_\_\_

Property: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3.



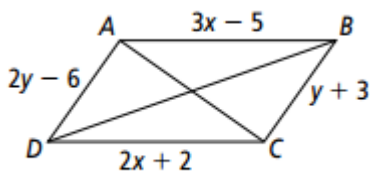
$a =$  \_\_\_\_\_

Property: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4.



$x =$  \_\_\_\_\_

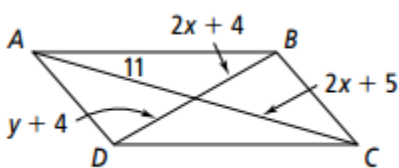
$y =$  \_\_\_\_\_

Property: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5.



$x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

Property: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

[6-11] Can you prove the quadrilateral is a parallelogram based on the given information? Explain.

6.




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7.




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8.

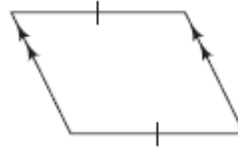



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9.

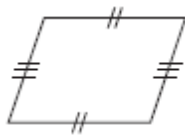



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10.




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11.



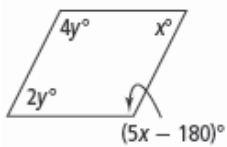

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[12-15] For what values of  $x$  and  $y$  must each figure be a parallelogram?

12.

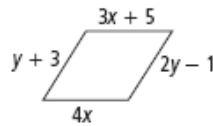


$x = \underline{\hspace{2cm}}$

13.

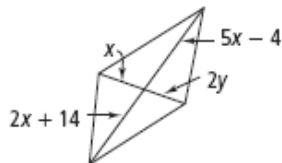
$x = \underline{\hspace{2cm}}$

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



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

14.

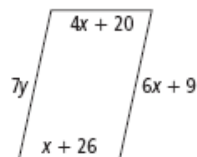


$x = \underline{\hspace{2cm}}$

15.

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

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

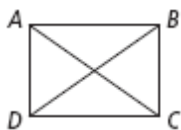


$y = \underline{\hspace{2cm}}$

16. A classmate draws a parallelogram for which one side is twice as long as the other. If one side is 26 units, what are all the possible lengths of the perimeter?

17. Complete the two-column proof.

Given: Parallelogram  $ABCD$  with  $\overline{AC} \cong \overline{BD}$   
 Prove:  $\triangle ADC \cong \triangle BCD$



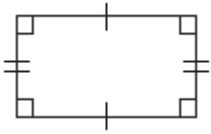
Statement	Reason
1. Parallelogram $ABCD$ with $\overline{AC} \cong \overline{BD}$	1. Given
2.	2. Opposite sides of parallelograms are congruent.
3. $\overline{DC} \cong \overline{CD}$	3.
4.	4. SSS

**Math 2 Unit 5 Worksheet 3**  
**Properties of Rhombuses, Rectangles, and Squares**

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_ Per: \_\_\_\_\_

[1-4] Decide whether the parallelogram is a rhombus, a rectangle, or a square. Explain.

1.

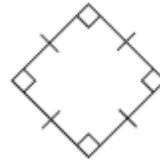


\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

2.

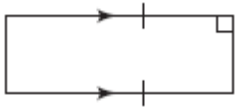


\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

3.

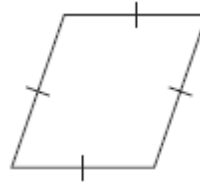


\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

4.



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

5. List 3 things that are TRUE about the diagonals of a rhombus.

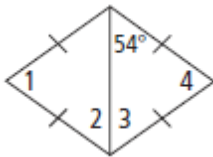
1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

[6-9] Find the measures of the numbered angles in each rhombus.

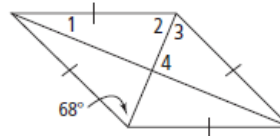
6.



$m\angle 1$  \_\_\_\_\_  $m\angle 2$  \_\_\_\_\_

$m\angle 3$  \_\_\_\_\_  $m\angle 4$  \_\_\_\_\_

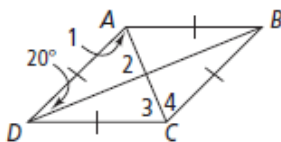
7.



$m\angle 1$  \_\_\_\_\_  $m\angle 2$  \_\_\_\_\_

$m\angle 3$  \_\_\_\_\_  $m\angle 4$  \_\_\_\_\_

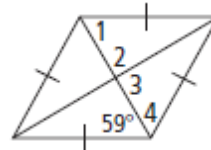
8.



$m\angle 1$  \_\_\_\_\_  $m\angle 2$  \_\_\_\_\_

$m\angle 3$  \_\_\_\_\_  $m\angle 4$  \_\_\_\_\_

9.



$m\angle 1$  \_\_\_\_\_  $m\angle 2$  \_\_\_\_\_

$m\angle 3$  \_\_\_\_\_  $m\angle 4$  \_\_\_\_\_

10. List 2 things that are TRUE about the diagonals of a rectangle.

1. \_\_\_\_\_

2. \_\_\_\_\_

[11-12]  $HJK$  is a rectangle. Find the value of  $x$  and the length of each diagonal.

11.  $HJ = 3x + 5$  and  $IK = 5x - 9$

12.  $HJ = 3x + 7$  and  $IK = 6x - 11$

$x =$  \_\_\_\_\_

$x =$  \_\_\_\_\_

$HJ =$  \_\_\_\_\_

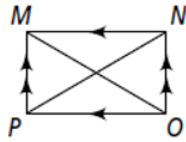
$HJ =$  \_\_\_\_\_

$IK =$  \_\_\_\_\_

$IK =$  \_\_\_\_\_

[13-14] Classify each of the following parallelograms as a rhombus, a rectangle, or a square. Explain.

13.  $\overline{MO} \cong \overline{PN}$

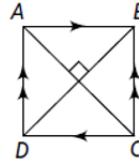


\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

14.  $\overline{AC} \cong \overline{BD}$

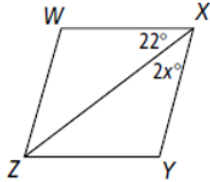


\_\_\_\_\_

\_\_\_\_\_

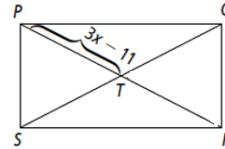
\_\_\_\_\_

15. For what value of  $x$  is parallelogram  $WXYZ$  a rhombus?



$x =$  \_\_\_\_\_

16.  $SQ = 14$ . For what value of  $x$  is parallelogram  $PQRS$  a rectangle? Find  $PT$  and  $PR$ .



$x =$  \_\_\_\_\_

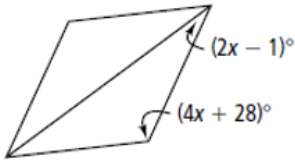
$PT =$  \_\_\_\_\_

$PR =$  \_\_\_\_\_

[17-24] For what value of  $x$  is the figure the given special parallelogram?

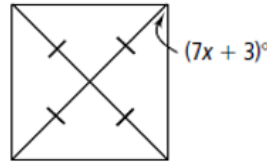
17. Rhombus

$x =$  \_\_\_\_\_



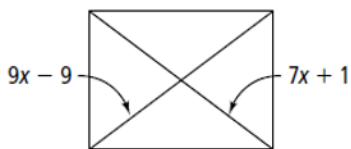
18. Square

$x =$  \_\_\_\_\_



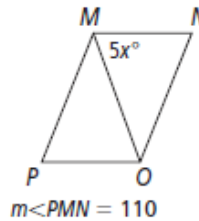
19. Rectangle

$x =$  \_\_\_\_\_



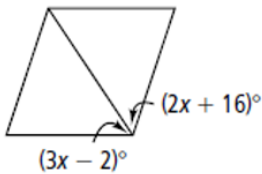
20. Rhombus

$x =$  \_\_\_\_\_



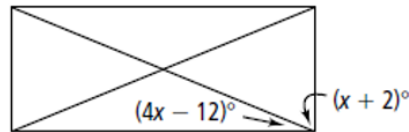
21. Rhombus

$x =$  \_\_\_\_\_



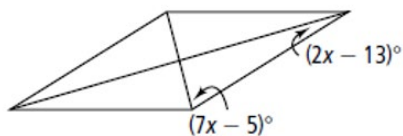
22. Rectangle

$x =$  \_\_\_\_\_



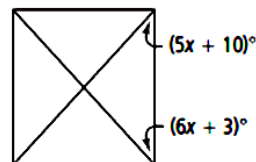
23. Rhombus

$x =$  \_\_\_\_\_



24. Rectangle

$x =$  \_\_\_\_\_



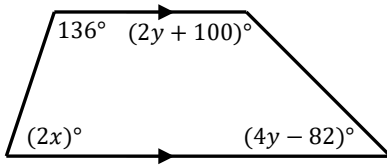
**Math 2 Unit 5 Worksheet 4**  
**Properties of Trapezoids**

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_ Per: \_\_\_\_\_

**Trapezoids**

[1-2] The given figures are trapezoids. Solve for the variable(s) in each diagram.

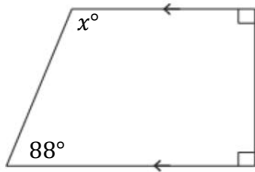
1.



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

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

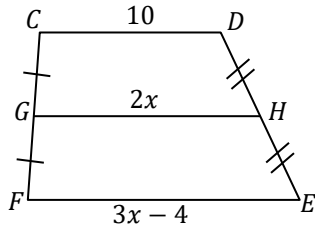
2.



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

[3-7] Find  $x$  and the length of the given segment in each trapezoid.

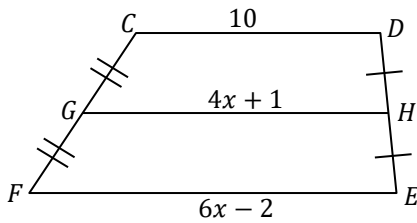
3.



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

$\overline{GH} = \underline{\hspace{2cm}}$

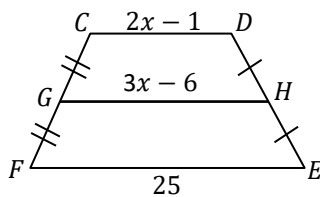
4.



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

$\overline{FE} = \underline{\hspace{2cm}}$

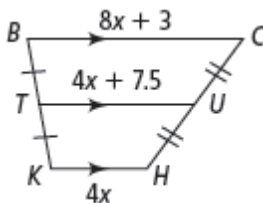
5.



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

$\overline{CD} = \underline{\hspace{2cm}}$

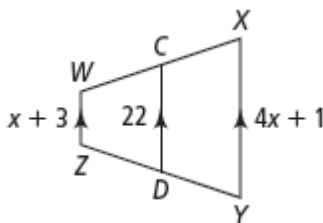
6.



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

$\overline{TU} = \underline{\hspace{2cm}}$

7.



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

$\overline{WZ} = \underline{\hspace{2cm}}$

## Isosceles Trapezoids

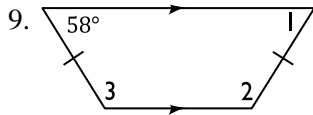
8. What is true about an isosceles trapezoid that is not necessarily true about all trapezoids?

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

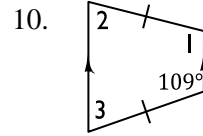
[9-10] Find the measures of the numbered angles in each isosceles trapezoid.



$m\angle 1 = \underline{\hspace{2cm}}$

$m\angle 2 = \underline{\hspace{2cm}}$

$m\angle 3 = \underline{\hspace{2cm}}$

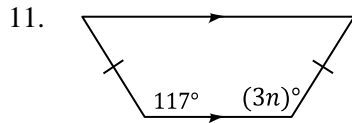


$m\angle 1 = \underline{\hspace{2cm}}$

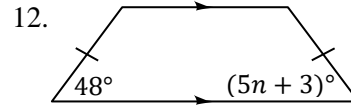
$m\angle 2 = \underline{\hspace{2cm}}$

$m\angle 3 = \underline{\hspace{2cm}}$

[11-12] Find the value of the  $n$  in each isosceles trapezoid.

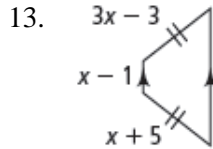


$n = \underline{\hspace{2cm}}$

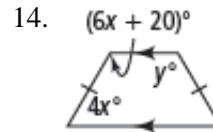


$n = \underline{\hspace{2cm}}$

[13-14] Find the value(s) of the variable(s) in each isosceles trapezoid.

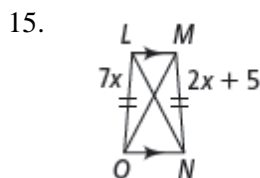


$x = \underline{\hspace{2cm}}$



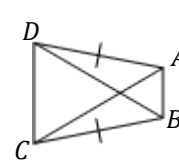
$x = \underline{\hspace{2cm}}$

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



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

16.  $AC = x + 5$   
 $BD = 2x - 2$



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

17. **Error Analysis.** What is the error in the following reasoning?

An isosceles trapezoid has one pair of parallel sides and one pair of congruent sides. Therefore, an isosceles trapezoid is a parallelogram.



18. Is it possible to draw an isosceles trapezoid with one pair of opposite angles congruent? Explain and include a drawing of your explanation.

[19-24] True/False. If false, draw a counter example.

19. True / False: Diagonals of a rhombus must be congruent.

20. True / False: All angles of a rectangle are congruent.

21. True / False: All sides of a rectangle are congruent.

22. True / False: The diagonals of a square form four right triangles.

23. True / False: A trapezoid cannot have a right angle.

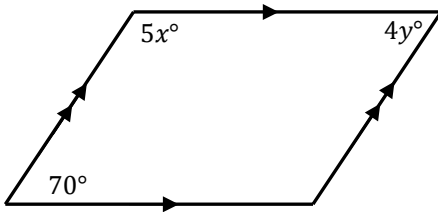
24. True / False: The diagonals of a parallelogram bisect the angles.

**Math 2 Unit 5 Worksheet 5**  
**Mid-Unit Review**

**Name:** \_\_\_\_\_  
**Date:** \_\_\_\_\_ **Per:** \_\_\_\_\_

[1-6] Solve for the variables. Give the best name for each of the following based upon given information and calculations. {Names of Quadrilaterals are: Quadrilateral, Parallelogram, Rectangle, Rhombus, Square, Trapezoid, & Isosceles Trapezoid}

1.

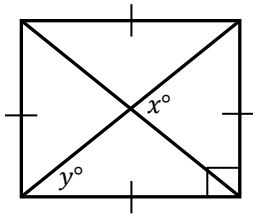


1.  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

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

2.

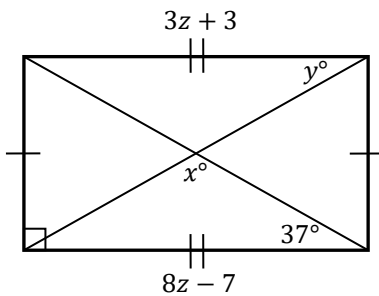


2.  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

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

3.



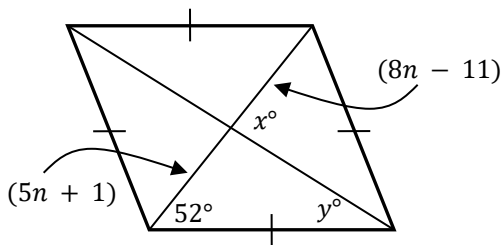
3.  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

$z =$  \_\_\_\_\_

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

4.



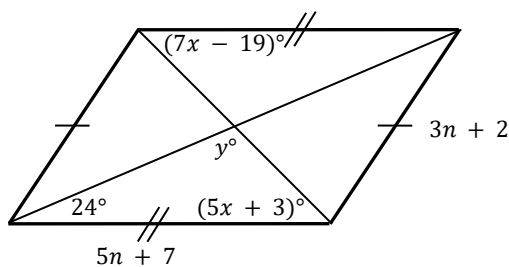
4.  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

$n =$  \_\_\_\_\_

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

5. Perimeter of Quadrilateral is 90 cm



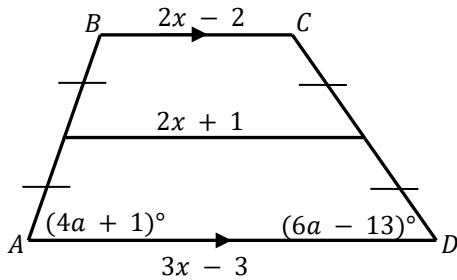
5.  $x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

$n =$  \_\_\_\_\_

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

6.



6.  $x =$  \_\_\_\_\_

$a =$  \_\_\_\_\_

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

7. Find the sum of the measures of the interior angles for the following convex polygon:

17-gon

7. \_\_\_\_\_

8. Find the measure of each interior angle for the following regular polygon:

Decagon

8. \_\_\_\_\_

9. Find the measure of each interior angle for the following regular polygon:

Pentagon

9. \_\_\_\_\_

10. Find the number of sides for a convex polygon whose interior angle sum is:

$3060^\circ$

10. \_\_\_\_\_

11. Find the number of sides for the following regular polygons, given:

The measure of each exterior angle is  $7.5^\circ$

11. \_\_\_\_\_

12. Complete the below chart on the **Properties of Quadrilaterals**

Property	Parallelogram	Rectangle	Rhombus	Square	Trapezoid
Sum of the interior angles is $360^\circ$					
Two pairs of opposite sides are parallel.					
Has exactly one pair of parallel sides.					
Two pairs of opposite sides are congruent.					
All sides are congruent.					
Diagonals are congruent.					
Diagonals are perpendicular.					
A diagonal bisects two angles.					
A diagonal forms two congruent triangles.					
Diagonals bisect each other.					
Opposite angles are congruent.					
All angles are right angles.					
Consecutive interior angles are supplementary.					

[13-24] Write **all**, **some**, or **no**, then explain.

13. \_\_\_\_\_ rectangles are squares.

---

14. \_\_\_\_\_ isosceles trapezoids are parallelograms.

---

15. \_\_\_\_\_ rhombuses are quadrilaterals.

---

16. \_\_\_\_\_ squares are triangles.

---

17. \_\_\_\_\_ rectangles are regular quadrilaterals.

---

18. \_\_\_\_\_ quadrilaterals have four congruent angles.

---

19. \_\_\_\_\_ rectangles are rhombuses.

---

20. \_\_\_\_\_ trapezoids have one pair of opposite sides parallel.

---

21. \_\_\_\_\_ trapezoids have two pairs of congruent sides.

---

22. \_\_\_\_\_ squares are regular quadrilaterals.

---

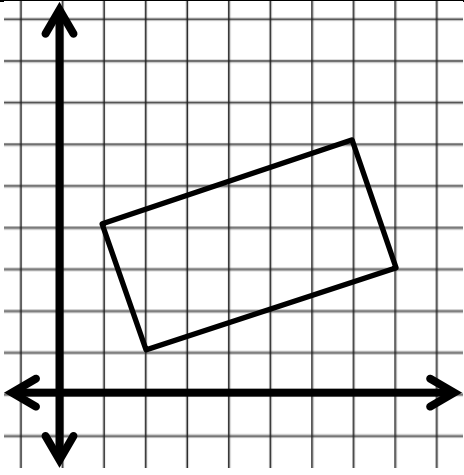
23. \_\_\_\_\_ trapezoids have four congruent sides.

---

24. \_\_\_\_\_ parallelograms have four congruent angles.

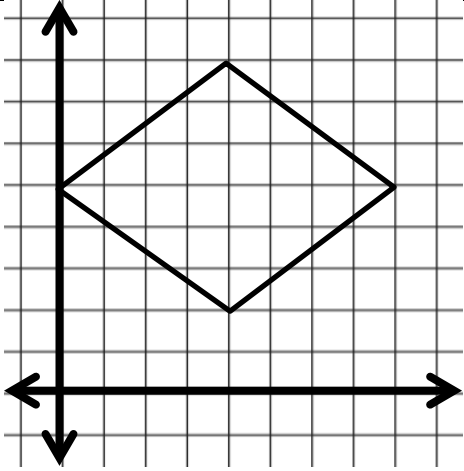
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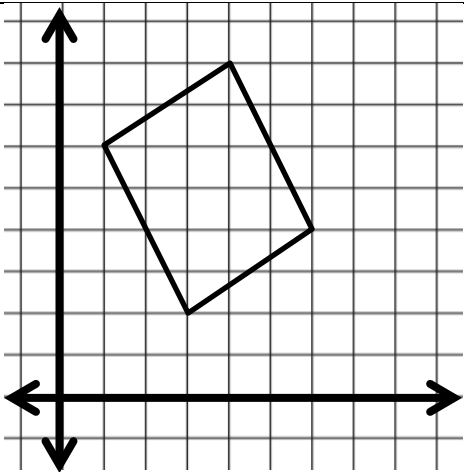
2.

Best Classification: \_\_\_\_\_



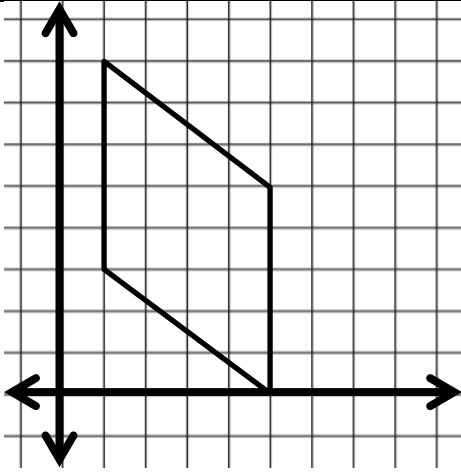
3.

Best Classification: \_\_\_\_\_



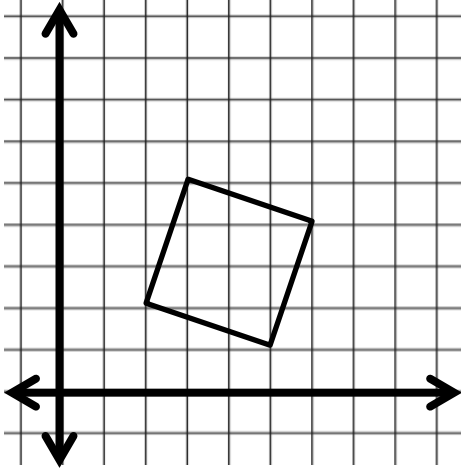
4.

Best Classification: \_\_\_\_\_



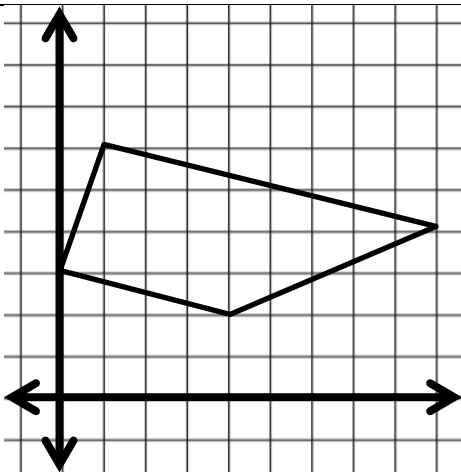
5.

Best Classification: \_\_\_\_\_



6.

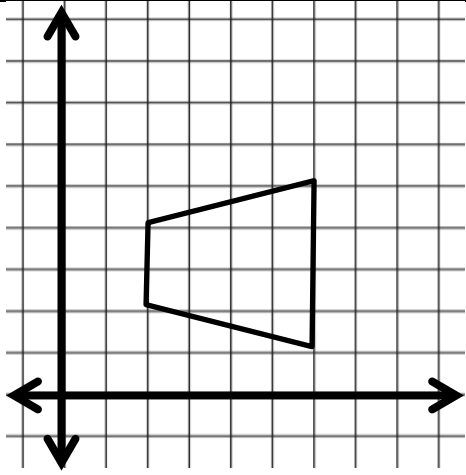
Best Classification: \_\_\_\_\_



7.

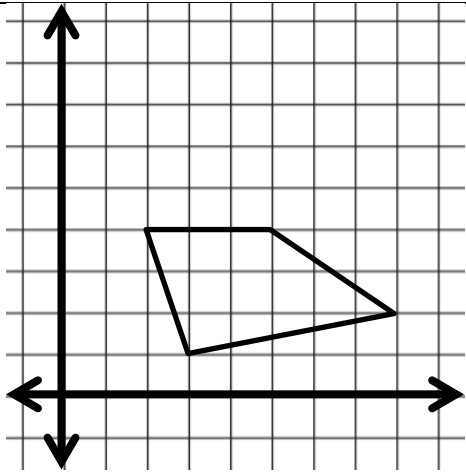
Best Classification: \_\_\_\_\_





8.

Best Classification: \_\_\_\_\_



9.

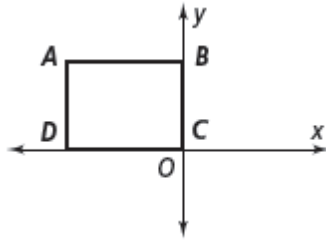
Best Classification: \_\_\_\_\_

**Math 2 Unit 5 Worksheet 7**  
**Using Coordinate Geometry**  
**to Prove Properties of Quadrilaterals**

Name: \_\_\_\_\_  
 Date: \_\_\_\_\_ Per: \_\_\_\_\_

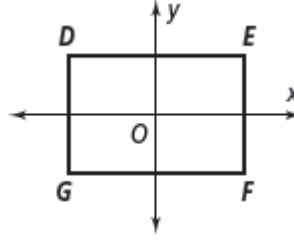
[1-3] What are the coordinates of the vertices of each figure?

1. Rectangle with base  $b$  and height  $h$



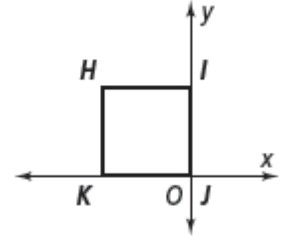
A (\_\_, \_\_) B (\_\_, \_\_)  
 C (\_\_, \_\_) D (\_\_, \_\_)

2. Rectangle centered at the origin with base  $2b$  and height  $2h$



D (\_\_, \_\_) E (\_\_, \_\_)  
 F (\_\_, \_\_) G (\_\_, \_\_)

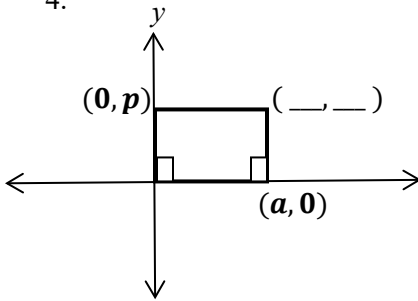
3. Square with height  $x$



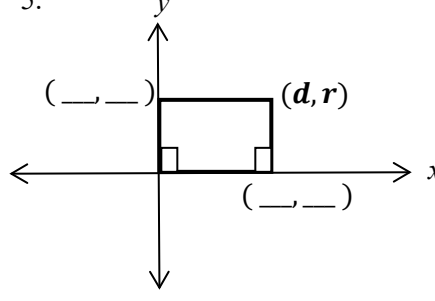
H (\_\_, \_\_) I (\_\_, \_\_)  
 J (\_\_, \_\_) K (\_\_, \_\_)

[4-12] Determine the missing coordinates in the diagrams. Do not introduce any new variables.

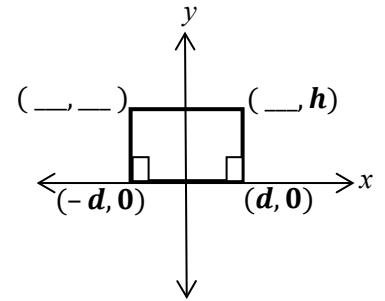
4.



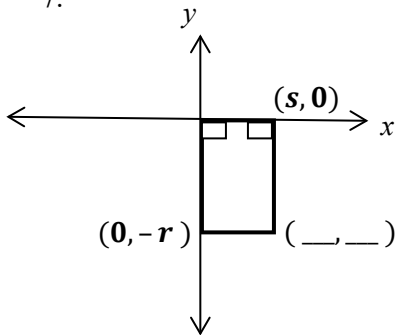
5.



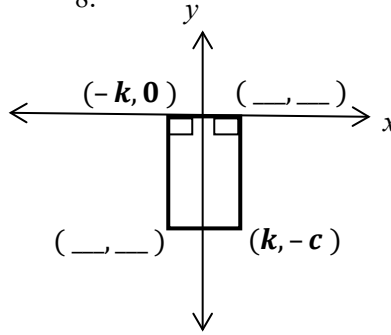
6.



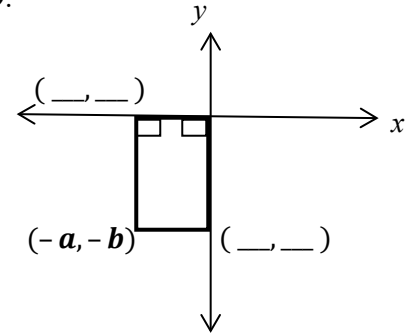
7.



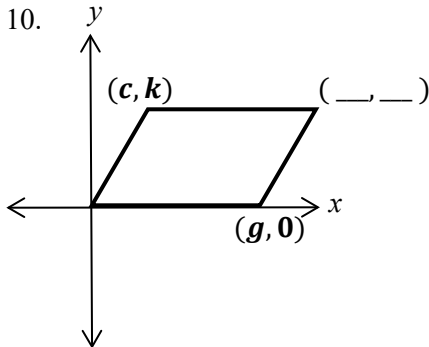
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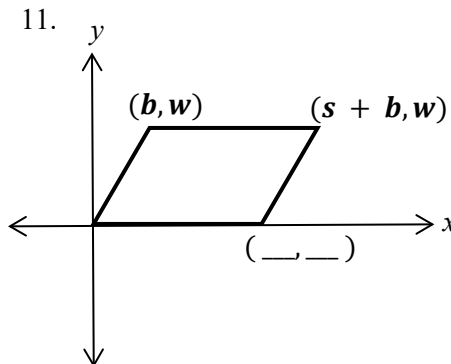
9.



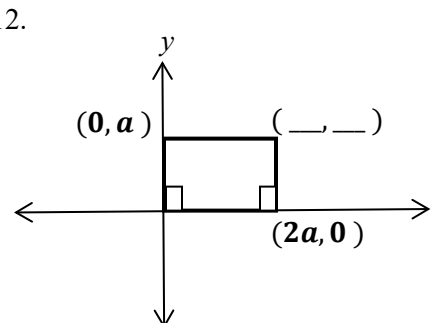
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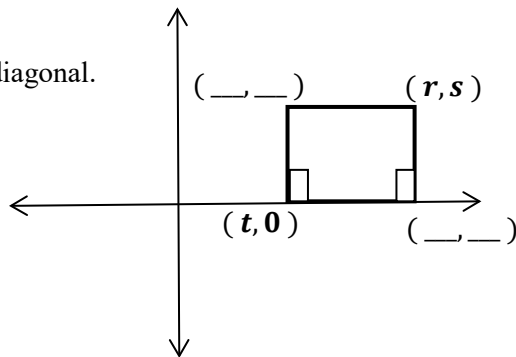
11.



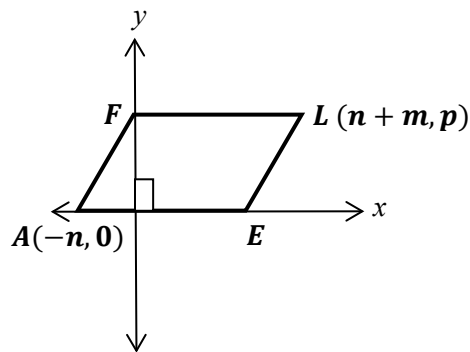
12.



13. Find the missing coordinates and find the midpoint of each diagonal.



14. Quadrilateral FLEA is a parallelogram. Find the coordinates for points F and E.



**E** (\_\_\_\_, \_\_\_\_)

**F** (\_\_\_\_, \_\_\_\_)

a) Show opposite sides are parallel using \_\_\_\_\_  
(which formula)

b) Show opposite sides are congruent using \_\_\_\_\_  
(which formula)

c) Show diagonals bisect each other using \_\_\_\_\_  
(which formula)

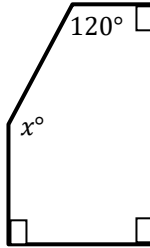
**Math 2 Unit 5**  
**Review Worksheet**

Name: \_\_\_\_\_  
Date: \_\_\_\_\_ Per: \_\_\_\_\_

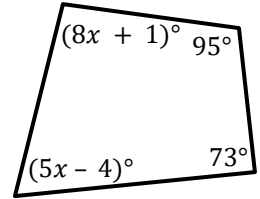
[1-20] Show all work for each problem.

NOTE: Diagrams are not drawn to scale.

1. What is the value of  $x$ ?
- A.  $540^\circ$
  - B.  $390^\circ$
  - C.  $150^\circ$
  - D.  $120^\circ$

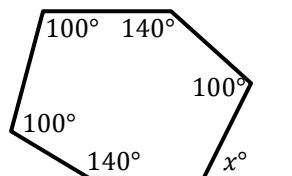


2. Determine the value of  $x$ .
- A. 15
  - B. 15.4
  - C. 9
  - D. 19.8



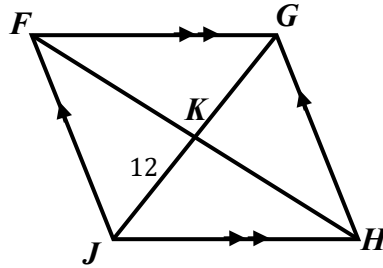
3. Determine the sum of the exterior angles of an octagon.
- A.  $1440^\circ$
  - B.  $1080^\circ$
  - C.  $360^\circ$
  - D.  $135^\circ$
4. Determine the measure of each interior angle of a regular sided polygon with 9 sides.
- A.  $1620^\circ$
  - B.  $180^\circ$
  - C.  $1260^\circ$
  - D.  $140^\circ$
5. Determine the measure of each exterior angle of a regular polygon with 12 sides.
- A.  $30^\circ$
  - B.  $150^\circ$
  - C.  $216^\circ$
  - D.  $36^\circ$
6. The measure of an interior angle of a regular polygon is  $162^\circ$ . How many sides does the polygon have?
- A. 18 sides
  - B. 20 sides
  - C. 16 sides
  - D. 10 sides

7. Determine the value of  $x$ ?
- A.  $80^\circ$
  - B.  $40^\circ$
  - C.  $60^\circ$
  - D.  $20^\circ$

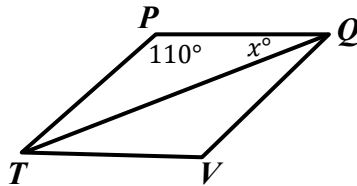


8. Find the number of sides for a regular polygon if each exterior angle has a measure of  $15^\circ$ .
- A. 2340
  - B. 180
  - C. 24
  - D. 26

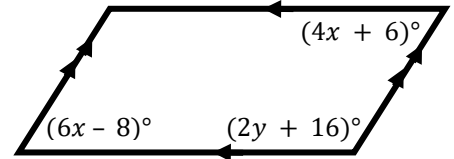
9. If  $FH = 30$ , find  $FK$ .
- A. 12
  - B. 18
  - C. 15
  - D. 30



10.  $PQVT$  is a rhombus. Determine the value of  $x$ .
- A.  $110^\circ$
  - B.  $55^\circ$
  - C.  $70^\circ$
  - D.  $35^\circ$



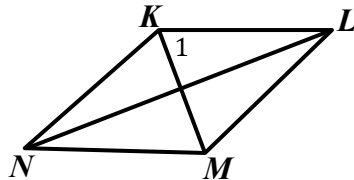
11. What are the values of the variables in the given parallelogram?
- A.  $x = 7, y = 9$
  - B.  $x = 7, y = 65$
  - C.  $x = 5, y = 71$
  - D.  $x = 3, y = 77$



Rule/Property used to solve for:
$x$
$y$

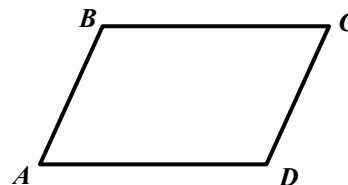
12. If  $KLMN$  is a rhombus, and  $m\angle KLM = 70^\circ$ , what is the measure of  $m\angle 1$ ?

- A.  $55^\circ$
- B.  $50^\circ$
- C.  $35^\circ$
- D.  $90^\circ$



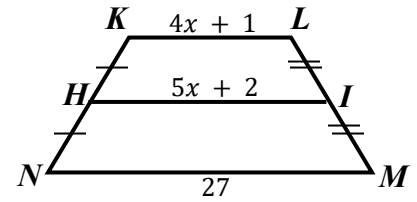
13. Which statements are true for a parallelogram? Select **all** that apply.

- A.  $m\angle A + m\angle B = 180^\circ$
- B.  $m\angle A + m\angle C = 180^\circ$
- C.  $\angle A \cong \angle D$
- D.  $\overline{BC} \cong \overline{AD}$
- E.  $\angle A \cong \angle C$



14. Determine the length of  $\overline{KL}$  in the trapezoid shown.

- A. 26
- B. 4
- C. 13
- D. 17



Rule/Property used to solve for  $x$ :

15. a) If  $m\angle A$  is  $80^\circ$ , find the measures of:

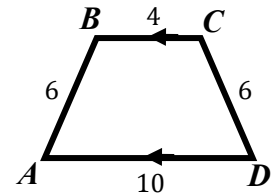
$m\angle B = \underline{\hspace{2cm}}$

$m\angle C = \underline{\hspace{2cm}}$

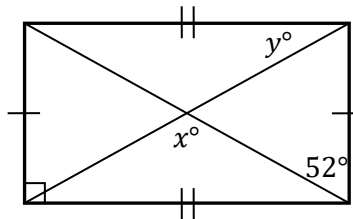
$m\angle D = \underline{\hspace{2cm}}$

b) What type of quadrilateral is  $ABCD$ ? Be as specific as possible.

\_\_\_\_\_



16. Determine the values of  $x$  and  $y$ .

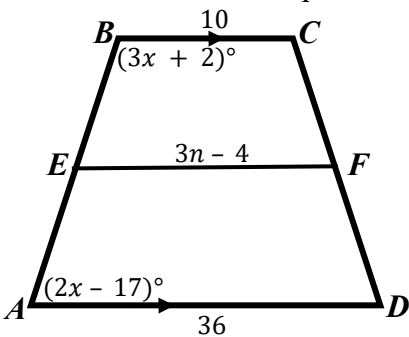


$x = \underline{\hspace{2cm}}$

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

Rules/Properties used to solve for  $x$ :

17.  $ABCD$  is an isosceles trapezoid with midsegment  $\overline{EF}$ . Determine the following:



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

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

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

$m\angle ADC = \underline{\hspace{2cm}}$

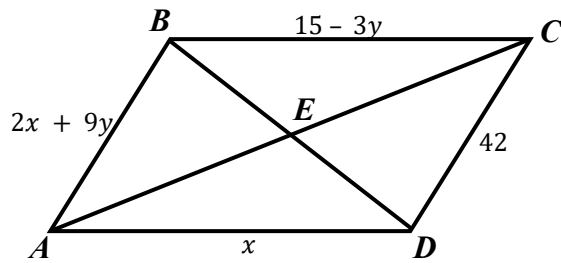
Rules/Properties used to solve for:

$x$

---

$n$

18.  $ABCD$  is a parallelogram. Determine the following:

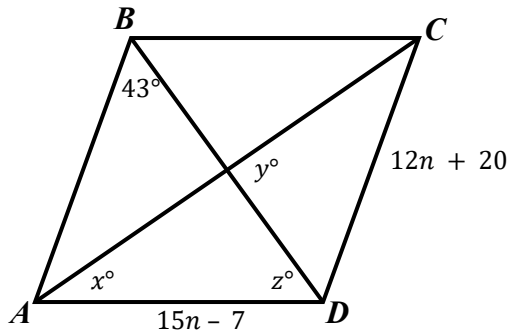


$$x = \underline{\hspace{2cm}}$$

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

Rule/Property used to solve for  $x$  and  $y$ :

19.  $ABCD$  is a rhombus. Determine the following:



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

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

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

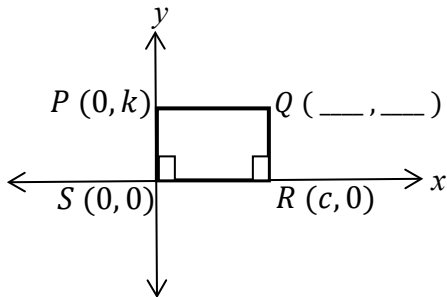
$$z = \underline{\hspace{2cm}}$$

Rule/Property used to solve:

$y$

$n$

20. For rectangle  $SPQR$  find the coordinates of  $Q$  (without using any new variables), and find the midpoints of  $\overline{PR}$  and  $\overline{SQ}$ .

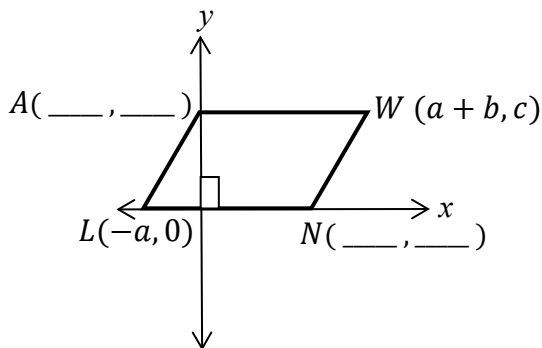


$$Q (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$$

$$\text{Midpoint of } \overline{PR} (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$$

$$\text{Midpoint of } \overline{SQ} (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$$

21. For parallelogram  $AWN L$  find the coordinates of  $A$  and  $N$  (without using any new variables), and find the midpoints of  $\overline{AN}$  and  $\overline{LW}$ .



$$A (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$$

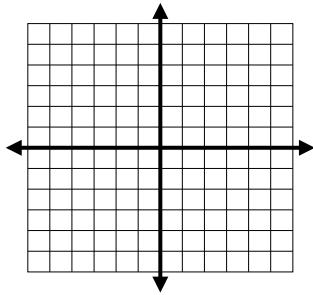
$$N (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$$

$$\text{Midpoint of } \overline{AN} (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$$

$$\text{Midpoint of } \overline{LW} (\underline{\hspace{1cm}}, \underline{\hspace{1cm}})$$

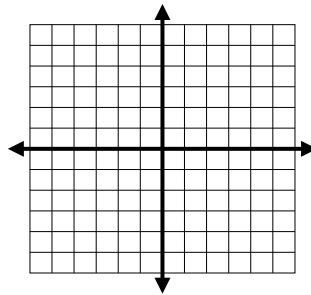
22. Plot the points  $A(1, -1)$ ,  $B(2, -4)$  and  $C(4, -2)$

A. Plot a fourth point  $D$  in quadrant 4 that will make a parallelogram.



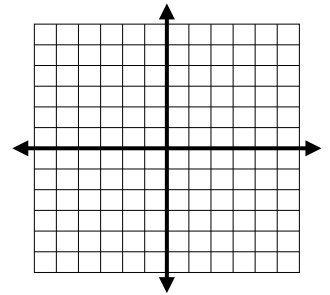
Explain why the quadrilateral formed is a parallelogram using the slope formula.

B. Plot a fourth point  $D$  in quadrant 3 that will make a parallelogram.



Explain why the quadrilateral formed is a parallelogram using the midpoint formula.

C. Plot a fourth point  $D$  in quadrant 1 that will make a parallelogram.



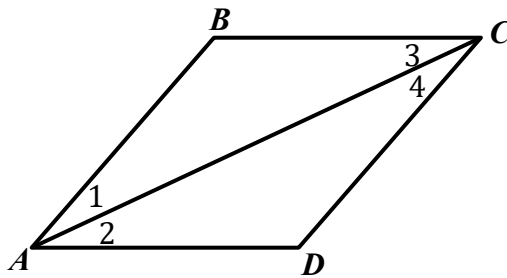
Explain why the quadrilateral formed is a parallelogram using the distance formula.

23. Determine whether each statement is **ALWAYS**, **SOMETIMES**, or **NEVER** true

	<i>Always</i>	<i>Sometimes</i>	<i>Never</i>
A rectangle is a square.			
A square is a rhombus.			
A trapezoid is a parallelogram.			
The diagonals of a parallelogram are perpendicular.			
The sides of a parallelogram are congruent.			



24. Samantha must prove this theorem:  
If  $\overline{AB} \cong \overline{DC}$  and  $\overline{BC} \cong \overline{DA}$ , then  $ABCD$  is a parallelogram.



$\overline{AB} \cong \overline{DC}$  and  $\overline{BC} \cong \overline{DA}$  because of given information.  $\overline{AC} \cong \overline{AC}$  by the reflexive property.  
 $\triangle ABC \cong \triangle CDA$  by the \_\_\_\_\_ theorem.  $\angle 1 \cong \angle 4$  and  $\angle 2 \cong \angle 3$  because corresponding parts of congruent triangles are congruent.  $\overline{AB} \parallel \overline{DC}$  and  $\overline{BC} \parallel \overline{AD}$  because if alternate interior angles are congruent then the lines are parallel.  $ABCD$  is a parallelogram by definition of parallelogram.

Which choice correctly fills in the blank line in the paragraph proof?

- A. SAS
- B. ASA
- C. AAS
- D. SSS
- E. HL
- F. CPCTC