Geometry A
Review of 8.1 – 8.3

Name: _____
Date: _____ Period: _____

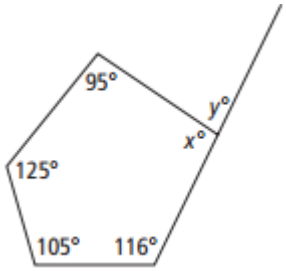
- ☐ I can find angle measures in polygons.
- ☐ I can use properties of parallelograms to find side lengths and angle measures.
- ☐ I can use properties to identify parallelograms.
- ☐ I can use coordinate geometry to identify parallelograms.

☐ I can find angle measures in polygons.

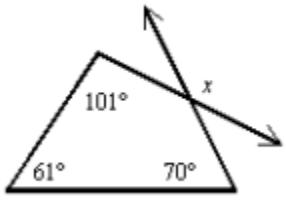
- ✓ I can find the sum of interior angles of a polygon using $(n-2)\cdot 180$
- ✓ I can find the measure of each interior angle of a regular polygon using $\frac{(n-2)\cdot 180}{n}$
- ✓ I can find the sum of the exterior angles of a polygon using 360
- ✓ I can find the measure of each exterior angle of a polygon using $\frac{360}{n}$

1) What is the sum of the interior angle measures of a 15-gon?

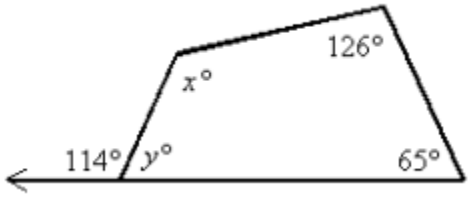
2) Find the values of the variables in the figure below.



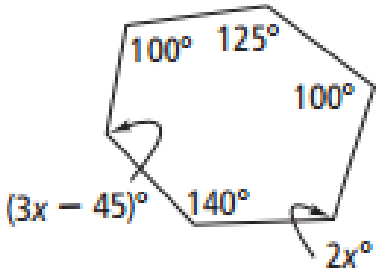
3) Find the value of *x*.



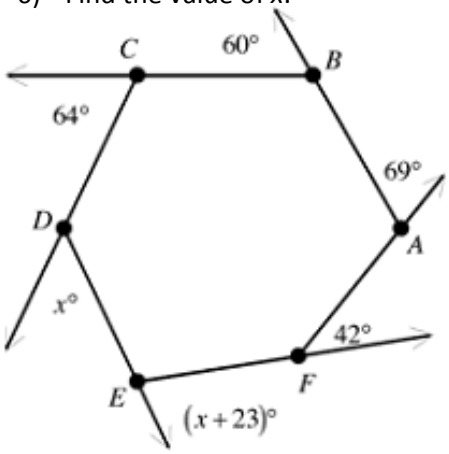
4) Find the values of *x* and *y*.



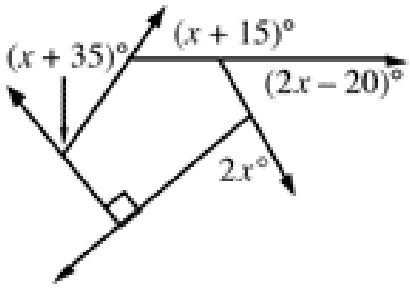
5) Find the value of *x*.



6) Find the value of *x*.



7) Find the value of *x*.



8) What is the measure of each interior and each exterior angle of a regular decagon?

9) Find the number of sides of a convex polygon if the sum of the measures of its interior angles is 2880°.

10) Find the number of sides of a regular polygon with each interior angle equal to 171°.

11) You are designing patterns for your art project. Can you form regular polygons with the given interior angle measures? If yes, how many sides would the regular polygon have?

a) 135° b) 130°

☐ I can use properties of parallelograms to find side lengths and angle measures.

- ✓ I can find lengths of opposite sides on parallelograms.
- ✓ I can find measures of opposite angles in parallelograms.
- ✓ I can find measures of consecutive angles in parallelograms.
- ✓ I can find lengths of diagonals in parallelograms.
- ✓ I can use properties of parallel lines to find angle measures in parallelograms.

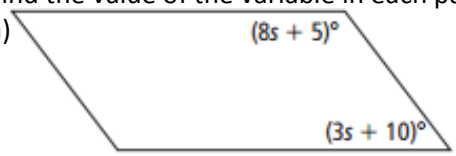
12) Consecutive angles in a parallelogram are always_____.

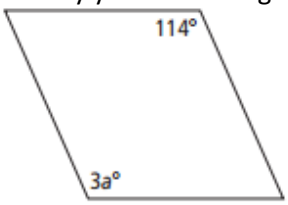
A) Congruent angles.
B) Complementary angles.
C) Supplementary angles.
D) Vertical angles.

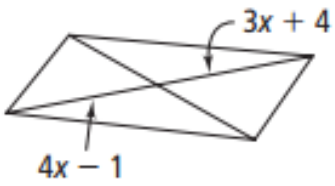
13) Choose the statement that is NOT ALWAYS true. For any parallelogram_____.

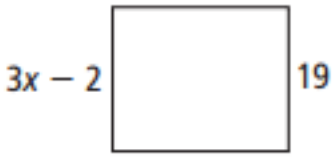
A) The diagonals bisect each other.
B) Opposite angles are congruent.
C) The diagonals are perpendicular.
D) Opposite sides are congruent.

14) Find the value of the variable in each parallelogram below. Justify your reasoning.

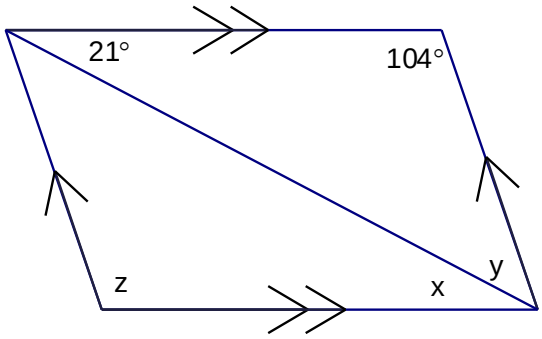
a) 

b) 

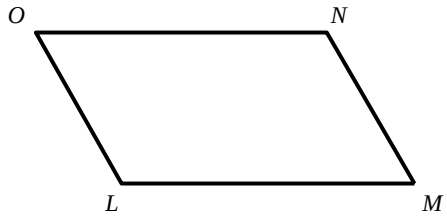
c) 

d) 

15) Find the values of the variables in the parallelogram.



16) If $ON = 7x - 5$, $LM = 6x + 3$, $NM = x - 4$, and $OL = 2y + 5$, find the values of x and y given that *LMNO* is a parallelogram.



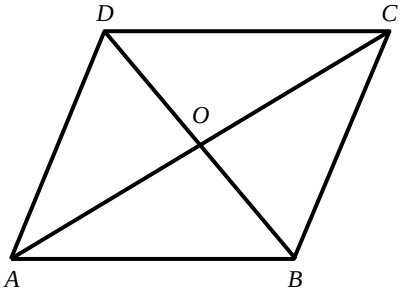
17) Complete each statement for parallelogram *ABCD*. Then justify your answer.

A) $\overline{AD} \cong$ _____

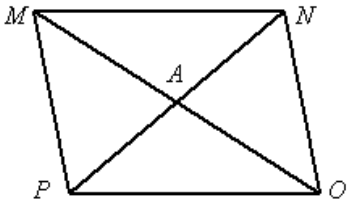
B) $\overline{OC} \cong$ _____

C) $\overline{CD}$ P _____

D) $\angle CBA \cong$ _____



18) Find *AM* in the parallelogram if *PN* = 10 and *MO* = 19.



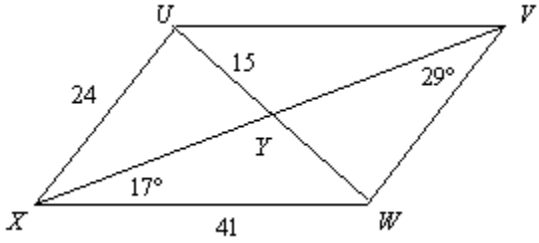
19) Use the diagram below to find each of the following.

a) $m\angle WVU =$ _____

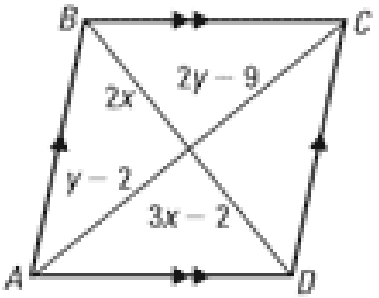
b) *WV* = _____

c) $m\angle XUV =$ _____

d) *UW* = _____



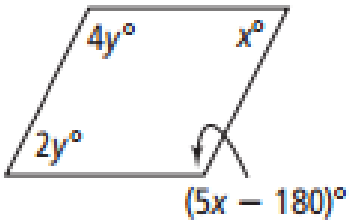
20) In the diagram below, please find *AC* and *BD*.



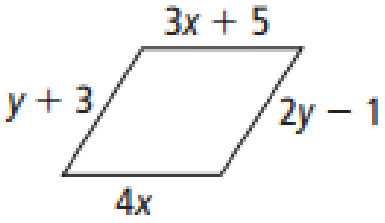
☐ I can use properties to identify parallelograms.

21) In each of the following, for what values of *x* and *y* must each figure be a parallelogram. Explain.

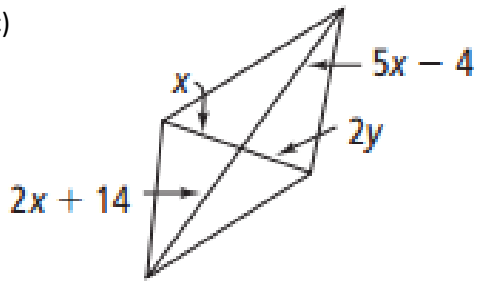
a)



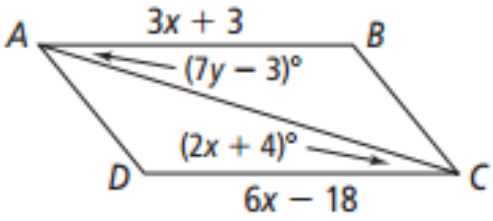
b)



c)

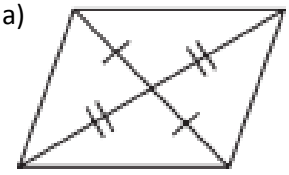


d)



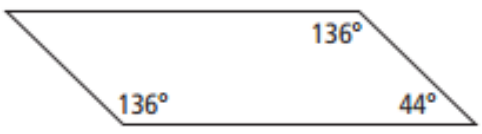
22) Can you prove that the quadrilateral is a parallelogram based on the given information? Explain.

a)

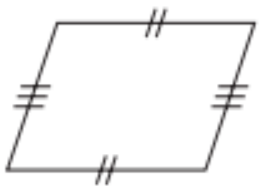


b)

c)

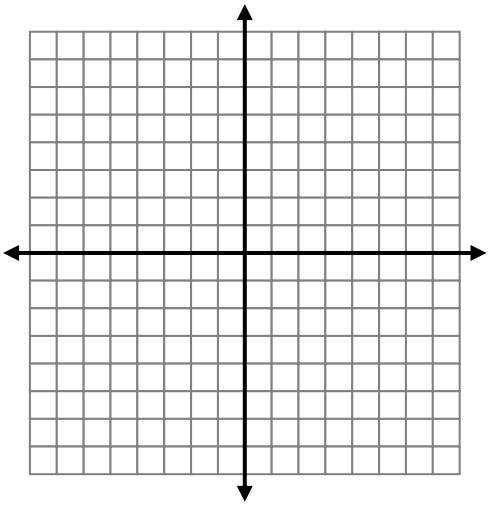


d)

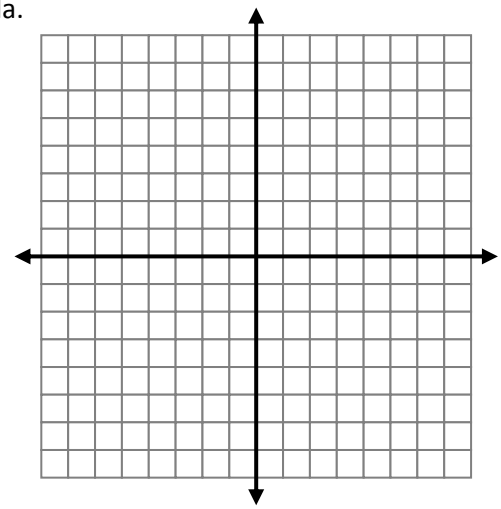


☐ **I can use coordinate geometry to identify parallelograms in the coordinate plane.**

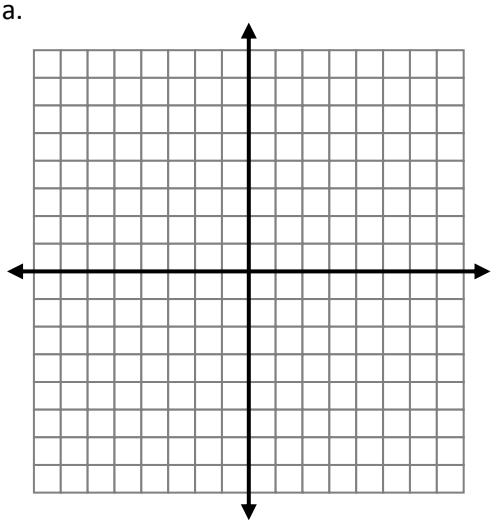
23) Given: Quadrilateral ABCD with A(-5, 0), B(4, -3), C(8, -1) and D(-1, 2).
Prove: ABCD is a parallelogram using the slope formula.



24) Given: Quadrilateral ABCD with A(-5, -5), B(-2, 4), C(6, 4) and D(3, -5)
Prove: ABCD is a parallelogram using the distance formula.



25) Given: Quadrilateral ABCD with A(-2, 3), B(3, 2), C(2, -1) and D(-3, 0)
Prove: ABCD is a parallelogram using the midpoint formula.



ANSWER KEY

1) 2340
2) X = 99, y = 81
3) X = 128
4) X = 103, y = 66
5) X = 60
6) X = 51
7) X = 40
8) Each interior angle measures 144°, each exterior angle measures 36°
9) 18
10) 40
11) a) Yes, it has 8 sides b) no, a regular polygon cannot be formed.
12) C
13) C
14) a) S = 15; In a parallelogram, consecutive angles are supplementary
    b) A = 38, in a parallelogram, opposite angles are congruent
    c) X = 5; in a parallelogram, diagonals bisect each other
    d) X = 7; in a parallelogram, opposite sides are congruent
15) X = 21, y = 55, z = 104
16) X = 8, y = -1/2
17) a) $\overline{BC}$; in a parallelogram, opposite sides are congruent
    b) $\overline{AO}$; in a parallelogram, diagonals bisect each other
    c) $\overline{AB}$; in a parallelogram, opposite sides are parallel (definition of parallelogram)
    d) $\angle ADC$, in a parallelogram, opposite angles are congruent
18) AM = 9.5
19) a) 46°
    b) 24
    c) 134°
    d) 30
20) AC = 10, BD = 8
21) a) x = 60, y = 30; For a quadrilateral to be a parallelogram, consecutive angles must be supplementary
    b) x =5, y = 4; For a quadrilateral to be a parallelogram, opposite sides must be congruent
    c) x = 6, y = 3; For a quadrilateral to be a parallelogram, diagonals must bisect each other
    d) x = 7, y = 3; For a quadrilateral to be a parallelogram, one pair of opposite sides must be both congruent and parallel
22) a) yes, the diagonals bisect each other
    b) No, not enough information
    c) yes, the missing angle measures 44°, so opposite angles are congruent
    d) yes, opposite sides are congruent
23) $slope\ of\ \overline{AD} = slope\ of\ \overline{BC} = \frac{1}{2} \Rightarrow \overline{AD} \parallel \overline{BC}$; $slope\ of\ \overline{AB} = slope\ of\ \overline{CD} = -\frac{1}{3} \Rightarrow \overline{AB} \parallel \overline{CD}$
    Opposite sides are parallel, so ABCD is a parallelogram
24) $AB = CD = \sqrt{90}$; $AD = BC = 8$; Opposite sides are congruent, so ABCD is a parallelogram
25) Midpoint of $\overline{AC}$ is (0, 1); Midpoint of $\overline{BD}$ is (0, 1). Since $\overline{AC}$ and $\overline{BD}$ have same midpoint, the diagonals bisect each other.