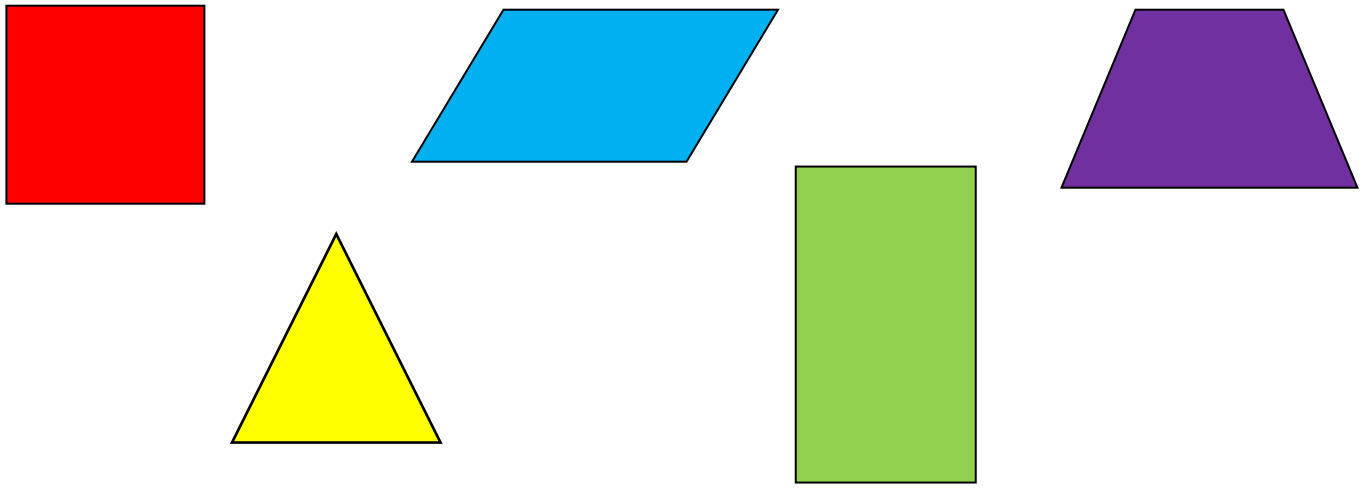
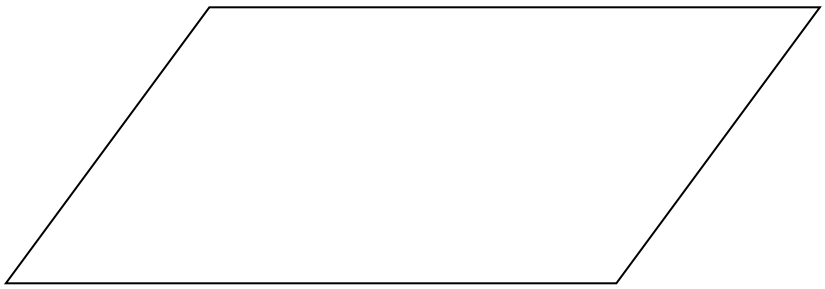
Geometry CC – Mr. Valentino Name: _____

Unit 9 Lesson 1: What are Parallelograms (Mr. Valentino's favorite shape, of course)? Date: _____ Per: _____

Do Now: Circle the shapes that you think are parallelograms





Properties of a parallelogram:

1) Opposite sides are _____.

2) Opposite sides are _____.

3) Opposite angles are _____.

4) Consecutive angles are _____.

5) The diagonals _____.

1) In parallelogram *ABCD*, the degree measure of angle *A* is represented by $2x$ and the degree measure of angle *B* by $2x + 60$. Find the value of *x*.

2) In parallelogram *ABCD*, $AB = 7x - 4$ and $CD = 2x + 21$. Find *AB* and *CD*.

3) The degree measures of two opposite angles of a parallelogram are represented by $3x + 40$ and $x + 70$. Find the measure of each angle.

4) Parallelogram *ABCD* is given with diagonals intersecting at *E*. If $DE = 4y + 1$ and $EB = 5y - 1$, find *DB*.

5) Parallelogram *ABCD* is given with diagonals intersecting at *E*. If $m\angle DAB = 4x - 60$ and $m\angle DCB = 30 - x$, find $m\angle DAB$, $m\angle DCB$, and $m\angle ABC$.

6) If the diagonals of parallelogram *ABCD* are $\overline{AC}$ and $\overline{BD}$, which is *always* true? (Circle all that apply)

(1) $\overline{AC} \cong \overline{BD}$

(2) $\angle DAC \cong \angle BAC$

(3) $\overline{AD} \perp \overline{BD}$

(4) $\Delta DAC \cong \Delta BCA$

7) In parallelogram *ABCD*, $m\angle ABC = 3x - 12$ and $m\angle CDA = x + 40$. Find $m\angle ABC$, $m\angle CDA$, $m\angle BCD$, and $m\angle DAB$.

8) The measures of angles *A* and *B* of parallelogram *ABCD* are in the ratio of 2:7. Find the degree measure of angle *D*.

9) In parallelogram *ABCD*, the diagonals meet at *E*. Which is *always* true? (Circle all that apply)

(1) ΔAED is an isosceles triangle.

(2) $\Delta ABD \cong \Delta CDB$

(3) ΔABD is a right triangle.

(4) ΔAEB is a right triangle.

10) In parallelogram *ABCD*, the measure of angle *A* exceeds the measure of angle *B* by 30 degrees. Find the degree measure of angle *C*.

11) In parallelogram *ABCD*, $BC = 9y + 10$, $AD = 6y + 40$, and $AB = \frac{1}{2}y + 50$. Find *BC*, *AD*, *AB*, and *DC*.

12) Parallelogram *ABCD* is given with diagonals intersecting at *E*. If $m\angle DCB = a + 12$, and $m\angle CDA = 4a + 18$, find the degree measures of all 4 angles of the parallelogram.

13) Parallelogram *ABCD* is given with diagonals intersecting at *E*. If $AE = 5x - 3$, and $EC = 15 - x$, find *AC*.

14) In parallelogram *ABCD*, which is *always* true? (Circle all that apply)

(1) *AB = AD*

(2) $AB = DC$

(3) $\overline{AB} \,//\, \overline{AD}$

(4) $\angle A \cong \angle B$