**Activity 2.5.2 The Vertical Angles Theorem**



**The Linear Pair Postulate**

1. In the figure at the right, *C* lies between points *A* and *B* on . Name the linear pair of angles.
2. Find the sum of the measures of the linear pair.
3. With pencil and straightedge or software draw another linear pair of angles.
4. Measure the two angles you have drawn and find their sum.
5. A pair of angles is called **supplementary** if the sum of their measures is 180°.
The **Linear Pair Postulate** states that if two angles form a linear pair, then they are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Applying the Linear Pair Postulate**

1. In the figure at the right m = 38°. Use the Linear Pair Postulate to find
 m = \_\_\_\_\_
 m = \_\_\_\_\_
 m = \_\_\_\_\_
2. Name two pairs of vertical angles in the figure above.
What do you notice about their measures?
3. In the figure at the right m = 103°. Use the Linear Pair Postulate to find
 m = \_\_\_\_\_
 m = \_\_\_\_\_
 m = \_\_\_\_\_
4. Name two pairs of vertical angles in the figure above. What do you notice about their measures?
5. Write a conjecture about vertical angles:

On the previous page you may have conjectured that every pair of vertical angles are congruent. Now you can prove this conjecture as a theorem. Give a justification for each step.

**The Vertical Angles Theorem:** If two lines intersect, then a pair of vertical angles formed are congruent.

Given: Lines *l* and *m* intersect at *Q*. and are a pair of vertical angles.

Prove: m = m.

Proof:

1. m + m = 180° Why?

2. m + m = 180° Why?

3. m + m = m + m Why?

4. m = m Why?