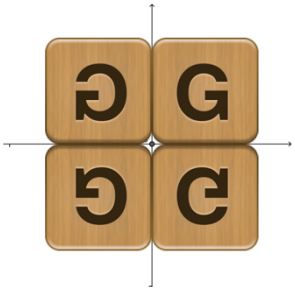
Geometry Unit 1: Transformations Name: _____

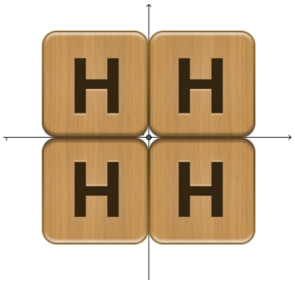
1.3.5 Our First Proof Date: _____ Period: _____

When you did the Alphabet Reflections and Rotations (1.3.2), you may have seen a connection between some of the results. Consider the following examples. Record these and 2 others in the table.



Reflections

Rotations



Reflections

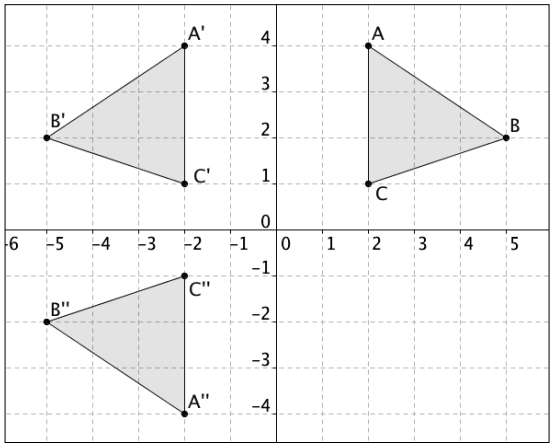
Rotations

Original Letter	Horizontal Reflection	Vertical Reflection	Both Reflections	180° rotation

What do you notice? Can you prove it? Try to convince me that it always works.

In math, we use logic to outline the steps from our given information to our desired conclusion. This is called a **proof**. Sometimes we organize it in two columns, with statements on the left and reasons on the right, sometimes we make a flow chart, and sometimes we write a paragraph summarizing the steps.

First we need to state what we're trying to prove. We'll choose a specific shape to work with so we can name it, let's pick ΔABC.



Given: ΔA'B'C' is a horizontal reflection of ΔABC

and ΔA"B"C" is a vertical reflection of ΔA'B'C'.

Prove: ΔA"B"C" is a 180° rotation of ΔABC.

Here's what we know:

The mapping rule for a horizontal reflection is (x, y) ➔ (_____, _____).

The mapping rule for a vertical reflection is (x, y) ➔ (_____, _____).

The mapping rule for a 180° rotation is (x, y) ➔ (_____, _____).

Explain how it works, using the mapping rules to help.