**Etch-a-Sketch Vector Addition Mini-Lab**

**Instructions:** *Today we will broaden our understanding of vectors using an Etch-a-Sketch. Please write the answers to the questions using complete sentences (avoid overusing the word “it” – be clear!)* ***on the back of this handout or on a separate sheet of paper stapled to this cover sheet.***

**Materials:**

* Etch-a-Sketch
* Ruler
* Protractor

**Procedure**:

1. Before you begin, make sure that the screen is clear (shake it upside-down) and the “etcher” is in the upper left-hand corner of the screen. The lines on both knobs should be horizontal when you begin.
2. Turn the left-hand knob 5 half-turns in the clockwise direction. What are the length and the direction of the resulting line?

Length: Direction:

1. Without erasing anything, now turn the right-hand knob 4 half-turns in the counter-clockwise direction. What are the length and the direction of the resulting line?

Length: Direction:

1. Return to your starting point, reversing along the same path you just created. How can you reach the same final spot as you did by the end of #2, but this time with only one line? Explain how you accomplished that task, and show Mr. Barker: (…in other words, how could you connect the open ends with one line?)

Explanation:

1. Measure the length and the direction (angle) of this resultant vector.

Length: Direction:

1. Explain IN WORDS how you could CALCULATE the length of this vector (from #5).
2. Complete the calculation you described in #6, using the measurements that you have made in the first two questions. How does this calculated value compare to the measured value you reported in #5?
3. Explain IN WORDS how you could calculate the DIRECTION (angle) of this vector.
4. Complete the calculation you described in #8. How does this calculated value compare to the measured value you reported in #5?