Name: _____ SB#: _____

WORK INDIVIDUALLY ON THIS ASSIGNMENT.

USE THIS SHEET AS THE COVER PAGE AND STAPLE YOUR ANSWERS TO THESE QUESTIONS TO IT.

1. Construct the following graphs for each of your two experiments.
    a. absorbance vs. time
    b. ln(absorbance) vs. time
    c. 1/(absorbance) vs. time

   Make sure you turn in all six graphs! Label the axes correctly (use units where needed). Include the regression lines and the slope, intercept, and R value for each.

2. Once you have all six plots, determine for each experiment which plot is the most linear. Note that the answer needs to be the same for both experiments. So, for example, if you can't decide among the three plots for experiment one, but you can decide the answer for experiment two, that's the answer for both experiments. Once you answer this question, you'll only be using two of the graphs in the reset of the report: one from experiment one, and the corresponding graph from experiment two.

3. Eventually you will determine k, m, and n and thus know the full rate law for this reaction:

   $$\text{rate} = k\,[\text{In}]^m\,[\text{OH}^-]^n$$

   For each of the two experiments, start by determining a value for m, and a value for k', where $k' = k\,[\text{OH}^-]^n$
   From the analysis of both experiments, m should be the same: it comes from deciding which graph is the most linear (item 2 above).
   For each of the two experiments, k' should be different, because each experiment had a different $[\text{OH}^-]_0$.

4. To determine n you need the two different values of k'. Follow the instructions in the lab handout. Because of experimental error, your value is unlikely to come out exactly to an integer. Round your answer to the nearest integer.

5. Finally, you can determine k from the equation $k' = k\,[\text{OH}^-]^n$. Since you have data for two independent experiments (each had a different $[\text{OH}^-]_0$) you can make two determinations of k. Because of experimental error, they are unlikely to come out to exactly the same value even though there is only one value of k for the rate law. Determine the value of k by averaging the two experimental values you determined.

6. Bring it all together. Write all in one place: rate law with k, m, and n filled in. Use units for k!

7. Assuming you were in charge of making this an effective lab experience, what suggestions for changes to the lab would you make?