W25 201-8 lab 1 lecture summary doc

For all three parts to turn in the first few steps are the same:

1. Title the graph and label the axes
2. Determine the scale for the axes
3. Plot the points from the tables given in the handout
4. Draw a best fit line that has half the points above and half below
5. Pick one point on the best fit line near the bottom of the graph () and one near the top of the graph

The first two calculations (slope and y-intercept) also have the same starting place for all three:

Slope:

y-intercept (b in this equation):

Where

This is all that is needed for , however there is another value,, you are asked to calculate for graphs 2 and 3.

We are given the nominal equation and we discussed in class how if we want to be able to draw a best fit curve that is a strait line we will have to either square the time data or take the square root of the mass data.

In order to calculate q we take the equation that we plotted and assume that the parts of it match up with our equation for the best fit line:

Below I have written the same equation but I have isolated the parts that we assume match up with each other with parentheses and the part we most care about with square brackets.

For #2 we looked at . In the given equation already appears the way that we graphed it (i.e. raised to the 2nd power) and so we don’t need to make any modifications to the equation before we set and find our value by solving for q and plugging in our value for .

This is not the case for #3. We need a term to be in the equation. We still start with and modify it until the term we need is present.

Things to remember when doing the math for this lab and on the upcoming quiz:

* All the values that we plot on our graphs or read off our graphs have units attached to them.
  + This means that the ordered pairs for our points will have units.
    - The 1st value has the same units as the horizontal axis
    - the 2nd value has the same units as the vertical axis
  + It helps to always write them as we do our math so that we remember any operations that we perform on them along the way to getting our answers.
  + This also helps me give you as much partial credit as I can justify giving.
* Whatever you do to one side of an equation you do to the other also
  + This applies to constants(numbers), variables and units
* When distributing exponents to fractions they affect both the top and the bottom in the same way
  + This applies to units too:
* Square roots are canceled by squaring them and vise versa both for numbers and units:
* Both sides of every equation must always have the same units.
  + If there is a value whose units we don’t know (like our *ms* & *q* values) we often use this fact to deduce what they should be.
  + If the units of a particular value that you plug in does not match the others they should do so after partially or fully canceling with those of another after any multiplication or division steps
* Please make sure that your final answers are clearly indicated by being circled/boxed and that it includes correct units and sig figs. For example, if a final answer that a velocity, , was 45 meters per second it would look like: