Quantitative Pendulum Lab Report

Brief Statement of the Problem
Describe the 'hypothesis,' which in this case is the formula we are trying to prove.
In this case, it is the formula for the period of a pendulum based on its length.
Show how this formula can be turned into a linear equation that can then be easily tested.

Method
Give a brief description of the method you used to collect data

Data table
- Include the raw data you collected and the variable transformation necessary to linearize the data.
- There should be at least 18 data points.
- There should be at least 6 different values of the independent variable.
- The greatest value of the independent variable should be at least 4 times the least value of the independent variable.
- Make sure that the data table is properly labeled with units

Linearized Graph
- Please make the graph by hand
- the graph should be at least 5 x 5 inches (or preferably a whole page of graph paper.
- label the axes clearly with units
- Chose horizontal and vertical scales that cause the points to be spread out.
- Do not connect points
- If the points are roughly a line, draw a line of best fit.
- Circle any outliers
- Do not put an arrow on the best fit line. This indicates the pattern continues forever, and it certainly does not.

Optional: Non-linearized graph
- You can optionally add a graph of the non-linearized data. There isn't any benefit to your grade for doing so.

Conclusion
- State whether or not the data are consistent with the hypothesis.
- Avoid the words "proved" or "confirmed"
- If the data are consistent with the hypothesis, state the *range* over which they are. This should be a range of values of the independent variable. Ideally, un-linearize the independent variable when making this claim. It may be the entire range you tested, or it may be a smaller range.

Calculation
- Calculate by hand the slope of your best-fit line.
- By using the formula in your hypothesis, calculate a value for earth's free fall acceleration based on this formula
- Calculate percent error for this value.
- Make sure you are using correct units.
- Make sure your answer is reasonable. For example, 0.01 m/s/s or 200 m/s/s are both NOT reasonable.

% error = |calculated value - theoretical value | / theoretical value x 100 %