Lofty Heights Lab Report

Physics

This is an individual assignment – you may hand-write or type it, but it should represent your own work (as follows from your group's data and discussions).

Using any pre-launch measurements you made, along with the measurements you took during last week's launch, respond to the following:

1. Describe (mathematically) the process and calculations you planned to use to estimate the maximum height of the rocket. Make sure to carefully and neatly show all the formulas you used, including derivations. Use clearly indicated variables for any of your measured values, and also highlight known values that weren't directly measured (for example, the acceleration due to gravity). **Your final answer for this part of the report should be a variable expression (or a series of related variable expressions).** In other words, do not show your final calculations here; just show how you planned to use your measurements to make a final calculation. (This corresponds to part 4 of the lab protocol.)

2. Using the process you developed in part 1, calculate the maximum height of the rocket. **Indicate your estimated height, and briefly discuss the possibility of error due to various causes.** If you had more than one way to calculate the height, compare the values you obtained to gauge how accurate your processes were.

3. ***Sketch x-vs-t, v-vs-t, and a-vs-t graphs for the rocket launch.*** You may need to do some additional (brief) research to determine what these graphs should look like. Don't guess! Verify your graphs with others, and use this as a learning opportunity: make sure you have complete comprehension of all of these graphs and why they look the way they do. Your sketches should be primarily theoretical; if you would like to consider things like air resistance, wind, or terminal velocity, please add those as additional sketches. For an extra challenge, consider and include in your graphs the time periods immediately before the launch and as/after the rocket hits the ground.