**AP Lab #6- Marble Energy**

**Followup Questions (add to Analysis)**

**Analysis:**

1. Showing all relevant work for the general case, calculate the velocity of the marble just as it leaves the table horizontally in terms of the acceleration of gravity *g* and the release height of the ramp *h*.
2. Using the launch velocity you calculated in step 1, and showing all relevant work, calculate the horizontal distance the ball is expected to travel once it leaves the table until it hits the ground in terms of the height of the table *Δy* and the release height *h*. (The constant here will be used as your theoretical value.)
3. Compare the constant in the relationship derived in the previous step to the slope of your linearized graph.  
    (Remember, "compare" means to find a percent difference)
4. What’s missing from our analysis? What is present that we are not measuring that might make up for the difference? Make a hypothesis here (that you will explore in more detail in the error analysis section in your conclusion.)
5. Showing all work, recalculate the final velocity in terms of the acceleration of gravity *g* and the release height *h*, but include rotational kinetic energy this time.
6. Using the launch velocity calculated in the previous step (that included rotational kinetic energy) recalculate the horizontal distance in terms of table height *Δy* and release height *h*.
7. Compare the linearized slope (re-graph if necessary) to the constant derived in the previous step to find a new % difference that includes rotational KE in the analysis.

**Conclusion** (Make sure to observe the guidelines given in the previous labs)**:** What do you conclude from your analysis? Is this what you expected? Why?

**Error Analysis:** Be sure to address the hypothesis you made in the Analysis section that   
 attempts to account for any differences between the hypothesized and

experimentally measured values.