Moment of Inertia– Prelab Quiz

Answer these questions after reading the "Moment of Inertia" assignment. Submit your answers via Blackboard as either a MS Word (.docx) or MS Excel spreadsheet file (.xlsx). Be sure to show all of your work so that partial credit can be given.

1. **[3 points]** Two expressions for the moment of inertia I are given in the assignment.

   Equation 2.10:
   $$I = C\left(mr^2\right), \tag{2.10}$$

   and Equation 2.15:
   $$I = \frac{2mr^2}{v^2}\left(gh - \frac{1}{2}v^2\right). \tag{2.15}$$

   Equate these two expressions and obtain an expression for the dimensionless quantity C.

   - What observable quantities remain when the equation is written this way?
   - What might be the benefit of writing the equation this way?

2. **[3 points]** The goal is to measure the quantity C from the parameters of a model that is fit to your data (measured values of h and v).

   Describe a plot that can be used to visualize your data. Explicitly show how the parameter C can be found from the fit parameters of your model.

3. **[4 points]** Using your expression above, calculate the uncertainty associated with the moment of inertia coefficient: δC.