Ballistic Pendulum Prelab
Due start of class, week of Nov 5

Name:____ Section:____________

In the ballistic pendulum experiment the prediction of the range depended on the height the pendulum arm swung up and the height of the chair. Equation (8) of your write-up states that the range, x. is given by

$$x = \frac{(m+M)}{m} 2\sqrt{hy}$$

and .

$$\frac{\Delta x}{x} = \frac{\Delta y}{2y} = \frac{\Delta x}{2h}.$$

Let $y = 0.55$ m, $\Delta y = 0.005$ m, $h = 0.090$ m, $\Delta h = 0.002$ m, $m = 50$ g and $M = 200$ g. What is the relative uncertainty in y and h? Set h to 0.09, change y by 0.01 and find the change in the range. Then keep y set to 0.55 and change h by 0.002 and find the change in range. In each case compare the change to $\Delta y/2y$ and $\Delta h/2h$. Comment on the contribution to the uncertainty of the range by each variable and why y has a larger absolute uncertainty but smaller contribution to the uncertainty of x.