# Lab 9: Ballistic Pendulum

Experiment for Physics 211 Lab at CSUF

## What You Need To Know:

## What You Need To Do:

### Part 1 – Guided Combo Problem

Based on what you observed, how many stages do you think there are in this situation? What kind of physics does each stage use? Decide on your answer before continuing.

|  |  |
| --- | --- |
| Trial  | ***h2***  |
| 1  |   |
| 2  |   |
| 3  |   |
| 4  |   |
| 5  |   |
| 6  |   |
| Ave. ***h2*** |   |
| ***h1***  |   |
| ***h***  |   |
| **vi.**  |   |

#### 3rd Stage

Table 1 – Part 1 3rd stage Data

|  |  |
| --- | --- |
| Object | Mass |
| Ball |   |
| Catcher | 116 g  |
| $$v'$$ |   |
| $$v\_{ball}$$ |   |

####  2nd Stage

Table 2 – Part 1 2nd stage Data

####  1st Stage

Table 3 – Part 1 1st stage Data

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| $$v\_{f} (m/s)$$ | $$m\_{ball} (kg)$$ | $$x\_{1} (m)$$ | $$x\_{2} (m)$$ | $$x (m)$$ | $$k (N/m )$$ |
|  |  |  |  |  |  |

### Part 2 – Combo Problem On Your Own

Write out the stages in your lab report in the same way that it was done in **Figure 3**. For each stage, write down what type of physics you are using and also derive the equation for each stage. Check with your instructor to see if your equations are correct before you move on.

Combine the results of Question 2 and Checkpoints 1-3 to derive an equation for the horizontal distance *D* that the ball moves in terms of things you know or can measure. Ask your instructor to check your result before continuing.

Table 4 – Part 2 D calculation Data

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  | D (m) |
|  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Trial | 1 | 2 | 3 | 4 | 5 | average | % diff |
| D | Table 5 – Part 2 D Measurement and Analysis  |  |  |  |  |  |  |

## Conclusion

Remove the graph paper from the rubber in the catch box and submit it to your instructor with your names on it.

Submit any excel or graphical analysis data your instructor requests along with your report.

Follow the lab report guide to write a conclusion on this lab.

Conclusion