

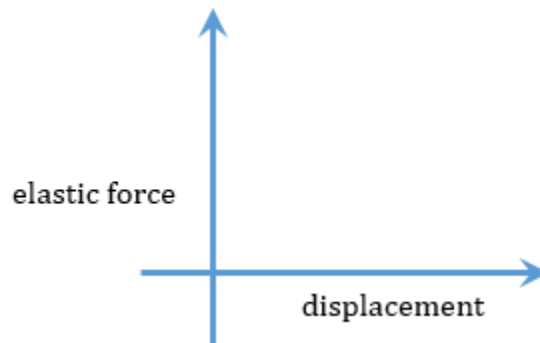
Name: \_\_\_\_\_ Section #: \_\_\_\_\_ Date: \_\_\_\_\_

## Hooke's Law

### Part 1: Measurement of a Spring Constant

#### Prediction

Make a sketch of the graph that will show how the displacement of the spring changes as the elastic force increases. Will it be a linear, quadratic, or cubic relationship? What physics quantity does the slope of this graph represent?



Run Part 1 of the experiment. Be sure to save a screenshot of your graph with the curve fit parameters applied. Be sure that all parameters are visible on the graph. Have one of your group members log into their WebAssgin account. Complete all required calculations there before you proceed to Part 2.

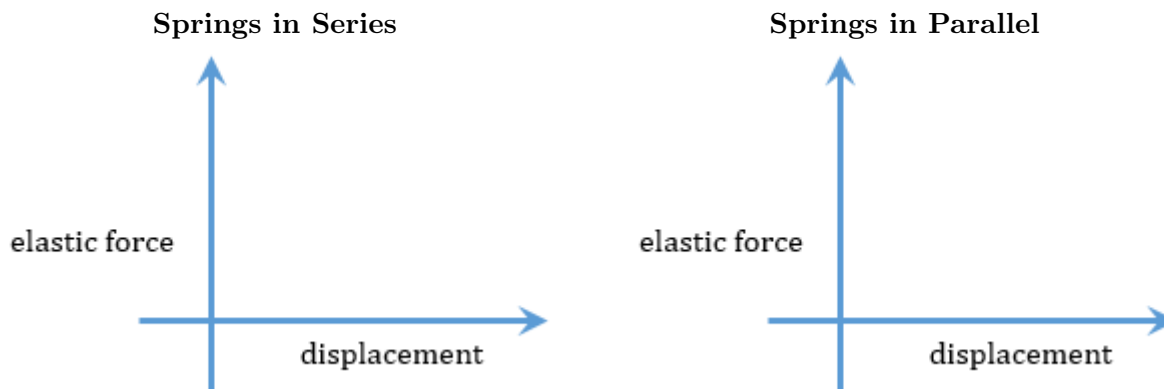
#### After the Experiment

Discuss the view of the elastic force vs. displacement graph. Does the shape of the experimental graph resemble the one you predicted? Why does the graph generated on the computer (method 2) have a curve at the beginning of the graph? Write the major points of your discussion below.

## Part 2: Springs in Series and Parallel

### Prediction

Sketch the graphs for the systems of springs in series and in parallel. Make it clear on both sketches how the slope of the graphs will be different compared to the slope of the graph in Part 1. Draw a slope for one string as a dotted line.



Run Part 2 of the experiment. Be sure to save a screenshot of your graphs with the curve fit parameters applied. Be sure that all parameters are visible on the graphs. Complete all required calculations in the Inlab before you proceed to Part 3.

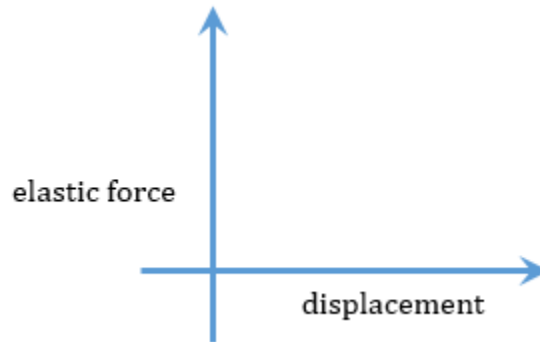
### After the Experiment

Discuss whether the values of the slopes support your predictions. For which system does the slope have the greater value? Smaller value?

## Part 3: Investigation of Nonlinear Springy Object

### Prediction

Make a sketch of the graph that will show how the displacement of the rubber band changes as the elastic force increases.



Run Part 3 of the experiment. Be sure to save a screenshot of your graph. No curve fit parameters should be applied here.

### After the Experiment

Discuss the view of the elastic force vs. displacement graph. Does the shape of the experimental graph resemble the one you predicted? Compare the shape of the graph produced by a spring with the one produced by the rubber band. Do both of these objects obey Hooke's Law? Write the major points of your discussion below.

**Be sure to upload the screenshots of all graphs produced for each part of the lab. All data should be visible on the graphs.**

**Data Analysis. Calculations.**

Show all your work (**equations and calculations**) that you did to get the answers submitted in each part of the Inlab.

Calculate the percent discrepancy between spring constants.

Calculate predicted values of displacement for a given force.

Have your TA sign this worksheet below and then upload it to the Inlab.

TA Signature: \_\_\_\_\_