Physics 152

Prelab 11

Imagine that you have a toy golf-ball cannon. This toy consists of a tube, a golf ball (mass $0.046 \pm 0.001\ kg$). Inside the tube there is a spring. You can compress the spring by preset amounts. You perform a series of tests by measuring the height the ball reaches when launched vertically for a variety of spring compressions. The following data was collected.

Trial	Spring compression (cm) (all measures have $\pm 0.1\ cm$ uncertainty)	Height
1	1	$0.19 \pm 0.01\ m$
2	1.5	$0.44 \pm 0.02\ m$
3	2	$0.77 \pm 0.04\ m$
4	2.5	$1.20 \pm 0.06\ m$
5	3	$1.75 \pm 0.09\ m$
6	3.2	$1.94 \pm 0.10\ m$
7	3.4	$2.21 \pm 0.10\ m$

a) Determine an analytic expression relating the height the ball can reach to the spring compression

b) Make a graph of the data and compare the results with those predicted in a)

c) Determine the force constant of the spring.