

## Unit 6 - Lab

### What Goes Up Must Come Down

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1. Place the can at the bottom of the ramp and practice rolling it up and down a few times. The can should start right at the bottom of the ramp and should only roll about half way up the ramp (try to roll straight). When you feel you have mastered this, move onto step #2.
  
2. On the calculator, Press PRGM and choose ANEW then press ENTER
  
3. On your calculator press  PRGM and choose RANGER Press ENTER twice  
 Choose 1: SETUP/SAMPLE and set it up as follows:
  - Real Time - NO
  - Time (S) - 2
  - Smoothing - LIGHTWhen finished, move cursor up to START NOW and press ENTER
  
4. Connect your calculator and the CBR, place the CBR at the top of the ramp. When ready, press ENTER on the calculator and roll the can. The graph should resemble a parabola, repeat this step until you are satisfied with your graph.  
SHOW TEACHER PARABOLA BEFORE CONTINUING
  
5. To delete extra data that is on either side of the parabola do the following:
  - Press enter to return to the RANGER MENU
  - Select 4: PLOT TOOLS
  - Select 1: SELECT DOMAIN
  - asks Left Bound? - move cursor to the left hand edge of the parabola and press ENTER
  - asks Right Bound? - move cursor to the right hand edge of the parabola and press ENTER
  
  - Press enter to return to the RANGER MENU
  - Select 7: QUIT

6. Because the data is already inputted into the calculator for you, you can now use the QuadReg function on your calculator to determine the actual equation of your graph. **Record this equation on the sheet you will be handing in!**
- ⇒ Press STAT
  - ⇒ Scroll over to CALC
  - ⇒ Select 5: QUADREG
  - ⇒ Press ENTER and **record this information!!**
7. Press “y=” button on your graphing calculator and enter the equation of your graph. Move the cursor up to the PLOT1 up top and press ENTER to deselect this. Then press GRAPH to see your parabola. (If you have two parabolas, you didn’t turn off the PLOT! – try again or ask for help before continuing).

Use TRACE to help answer the questions below.

**Questions – answer them on the sheet you will be handing in.**

- a) Determine the coordinates of the vertex of your parabola.
- b) How close did the can come to the motion detector?
- c) At what time was the can the closest to the motion detector?
- d) How far from the motion detector is the can after 1s? Use TRACE on your calculator to determine this.
- e) How far from the motion detector is the can after 1s? Use your equation to determine this – you must show ALL your work.