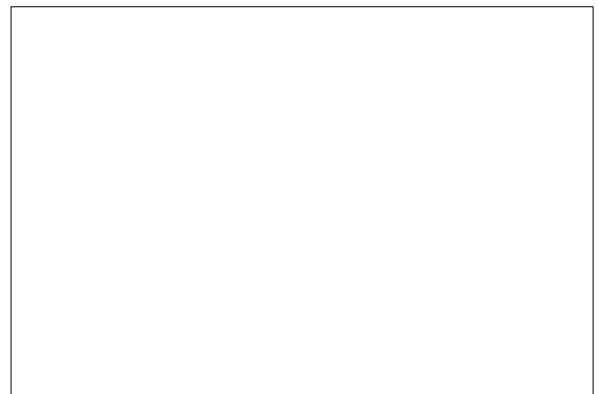


Analyzing the Bounce Height of a Racketball

You need to gather together one racketball and one meter stick. You are going to drop the racketball from various heights and record both the original height and the height of the first bounce. Perform the experiment 6 times.

Starting Height	Bounce Height

- Study the data in the chart. From the data, predict two additional bounce heights for two additional starting heights. Rerun the experiment for these two new heights.
- What is the relationship between the original height and the bounce height?
- Create a scatterplot for the data by placing the starting height in L1 and the bounce height in L2.
- Make a sketch of your scatterplot at the right.
- Use Manual Fit from the Stat, Calc command to fit a line to the data. When you have positioned the line so it fits the data, press ENTER. The equation for the line will appear at the top of the screen. Adjust the constant in front of the x to 2 decimal places. Adjust the constant at the end of the equation to match what you believe the height of bounce will be if the initial height



is zero. When you are satisfied with the values press 2nd Quit and the equation will be stored in Y1.

- Explain the meaning of the value of the constant in front of the x.
- Study the scatterplot and the graph of the line that you drew through the data. Explain the meaning of points that appear above the line.
- Explain the meaning of points that appear below the line.
- Return to Stat. 1. Edit and move to the top of L3. Enter the expression "y1(L1)" and press ENTER. Use the "" marks around the expression.
- Turn off the first scatterplot and set up a scatterplot for L1 vs. L3. How is the graph different from what you drew on page 1?
- Use the graph of the line to predict a new bounce height for a new starting height. Explain how you used the graph to do this.
- Return to the lists and confirm these two heights by entering numbers in L1. Explain what happened in the table.
- Select a bounce height. How would you predict the starting height that will produce that bounce height.
- Press y= and look at y1. Explain how the number in front of the x can be used to find the new bounce height from a new starting height.
- Explain how the number in front of the x can be used to find the starting height for a new bounce height.