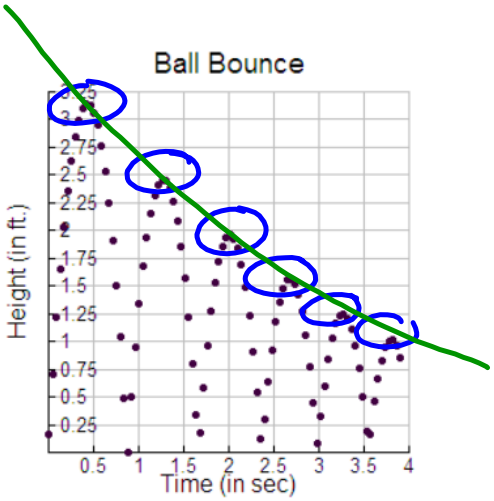
Combining Functions

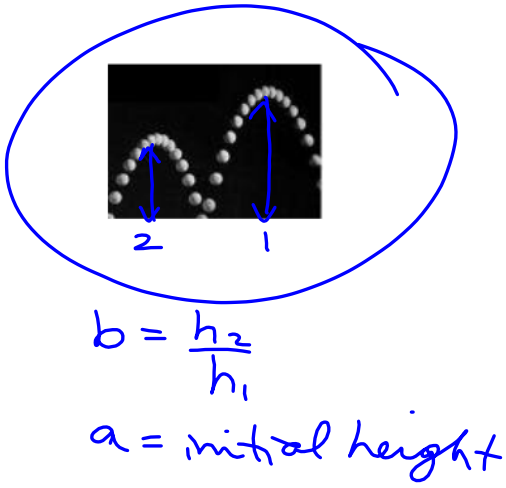
Part 1: Exploring Combinations of Functions

Complete investigation on pages 518 and 519 of the text book, using a separate piece of paper.

Part 2: The Bouncing Ball

By recording the height of a bouncing ball, you would find that the graph of time after the ball released vs. the height of the ball from the ground formed a series of parabolas. Your graph should have looked something like this.





$b = \frac{h_2}{h_1}$

a = initial height

In this activity, we are going to investigate how the maximum height of each parabola changes from bounce to bounce.

From the graph approximate the maximum height of each bounce and record in the table..

Bounce Number	Height (in ft.)
1	3.2
2	2.45
3	2
4	1.6
5	1.3
6	1.05

The Bouncing Ball (Continued)

1. Make a scatterplot of the data in your chart.

2. What kind of function do you think would model this data?

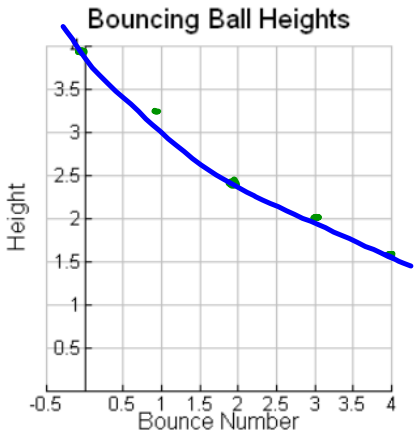
exponential

3. Complete the appropriate regression, and add the curve to your scatterplot.

$y = 3.890(0.803)^x$

4. Give your regression equation and sketch the graph below.

Equation:



You probably found an exponential regression, an equation of the form $y = ab^x$.

5. What might **a** stand for in the real world situation?

initial ball height

6. What might **b** stand for in the real-world situation?

the elastic properties of the ball { the energy returned

7. Can you find a function to look like the bouncing ball data on the first page if the scale factor of the photo is 1:10?

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