Rolling Dice

1. Roll forty 10-sided dice, and remove the dice that came up with a 0. Repeat this over and over. Record the results in the second column below:

	How many dice are left		
How many rolls	Your experiment	Class average	Theory
0	40	40	40
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

Rolling Dice (cont)

2. Fill out the "class average" column.

3. Start Geogebra on your laptop. Choose the **Spreadsheet** view.
   a. Enter the number of rolls in column **A** (0 to 20). (You don't have to type all the numbers: there's a shortcut.)
   b. Enter the class average data in column **B**. (There is no shortcut.)
   c. Right-click the graphics area, and choose **Graphics….**
   Set the **xmin**, **xmax**, **ymin**, and **ymax** numbers in a way that makes sense for this problem.
   d. Select columns **A** and **B** in the spreadsheet, right-click, and choose **Create > List of Points**.

The points should appear in the graphics area.

4. Fill out the "theory" column in your table, by figuring that, on average, about 10% of the dice get removed each time. This is theoretical, so you do not need to round to the nearest whole number, even though we're talking about dice.

5. Write an equation for the theoretical number of dice left as a function of the number of rolls, in "y=" form.

6. To graph the function, select "Input Bar" in the View menu, and enter the formula there.

Your function's graph should appear in the graphics area.

7. Is the formula a good model for the data?

8. Is the function continuous or discrete?

9. Does it have a y-intercept? What is its significance?

10. Does it have an x-intercept? What is its significance?

11. Write the equation using "a" instead of 40 and "b" instead of 0.9.

Because x is in the exponent, this function is called an *exponential function*.