## From Chapter 2:

## 2.1 Application: A Rumor Spreads

Suppose that in a population of 200 people, a rumor begins to spread. At first, perhaps just a few people have heard it. After a few weeks, everyone has heard it. Can we model the spread of the rumor with calculus?

## Laboratory: Rumor

We can. Let R(t) be the number of people on day t who have heard the rumor. Let's say that at the start, when t is 0, only one person has heard the rumor, that is, R(0) = 1. Let's say R(12) = 200, that is, after 12 days everyone knows the rumor.

1. What should the curve R = R(t) look like? Which of the curves below seems most realistic?



2. What differential equation provides a good model for the spread of a rumor? For example, if you think R should grow geometrically, you would choose

R' = kR (k constant).

If you think R should grow arithmetically, you would choose

R' = k (k constant).

Include at least one constant. Later, we'll ask you to adjust your constants so that your curve fits some data.

*Hint:* Remember that it takes two to spread a rumor—some who knows and someone who doesn't.

3. Now we want you to collect some data. We want you to start a rumor and watch it spread!

Equipment needed:

A bell At least 20 people A copy of the card below for each person.

Rumor:		
	Still	Heard
	haven't	it
	heard	now!
Ring 1:		
Ring 2:		
Ring 3:		
Ring 4:		
Ring 5:		
Ring 6:		
Ring 7:		
Ring 8:		
Ring 9:		
Ring 10:		
Ring 11:		
Ring 12:		

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