

Name: _____ Date: _____

Rumors

Susanna heard some exciting news about a well-known celebrity. Within a day she told 4 friends who hadn't heard the news yet. By the next day each of those friends told 4 other people who also hadn't yet heard the news. By the next day each of those people told four more, and so on.

1. Assume the rumor continues to spread in this manner. Let N be the function that assigns to d the number of people who hear the rumor on the d th day. Write an expression for $N(d)$.

2. On which day will at least 100,000 people hear the rumor for the first time?

3. How many people will hear the rumor for the first time on the 20th day?

4. Is the answer to (c) realistic? Explain your reasoning.

Rumors		Rubric	
<p>The core elements of performance required by this task are:</p> <ul style="list-style-type: none"> Construct exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). <p>Based on these, credit for specific aspects of performance should be assigned as</p>		points	section points
1.	Gives correct answer: $N(d) = 4^d$	1	1
2.	Gives correct answer: the ninth day Partial credit is given for 8.3 days	2 1	2
3	Gives correct answer: 1,099,511,627,776 people	1	1
4.	Gives correct answer such as: The answer in part (c) exceeds the number of people on Earth, so it is unrealistic. Eventually, the number of people hearing a rumor for the first time must cease to increase, because the number of people is finite.	2	2
Total Points			6