Math Connections

Happy Winter Break! Keep your skills sharp by practicing math and science during your time off.

Name: _____ Date: _____

Mrs. Hanover is a biomedical engineer. She works for a pharmaceutical company that has been working on a new antibiotic medication. Mrs. Hanover has discovered a new bacteria that may help doctors to be more effective when treating fatal infections in patients. Mrs. Hanover is responsible for measuring the bacteria's growth over time. The results are below.

Time, h	Number of Bacteria, b
0 hours	500,000
1 hours	1,000,000
2 hours	2,000,000
	4,000,000
5 hours	16,000,000
6 hours	
7 hours	

1. How many bacteria will be present in the sample after 7 hours?

2. How much time would it take for the bacteria population to grow to 8,000,000?

3. Which pattern describes the relationship between the number of hours and the number of bacteria?

    A. The number of bacteria is increasing by 2,000,000 each hour.
    B. The number of bacteria is the sum of the hours plus 2,000,000.
    C. The number of bacteria is the product of the hours times 2,000,000.
    D. The number of bacteria is doubling every hour.

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4. Create a graph from the table on the previous page. Remember to label your x- and y-axes, and title your graph.
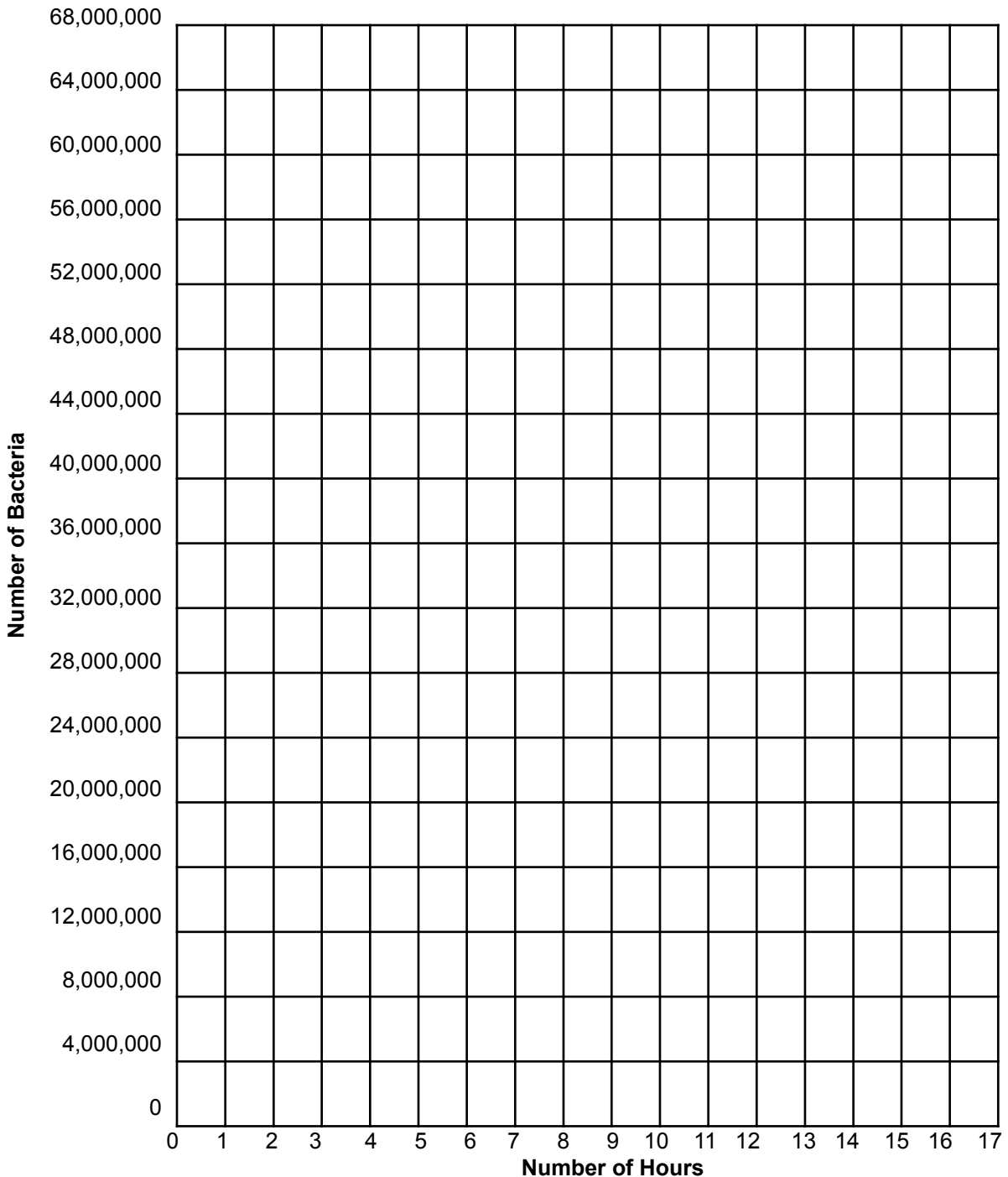

5. How many bacteria will be present after 10 hours? List the point below as an ordered pair. (The graph is not large enough to plot it.)

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Successful species in a given area have the ability to grow its population, also known as **population density**. While studying *vibrio natriegens*, or *V. Natriegens*, scientist plotted the growth in population density over time. *V. Natriegens* is a marine bacterium that is commonly found in mud surrounding the mouths of rivers. Because this bacterium has a short incubation period, data was recorded in minutes.

Population Density of *V. Natriengens* Over Time
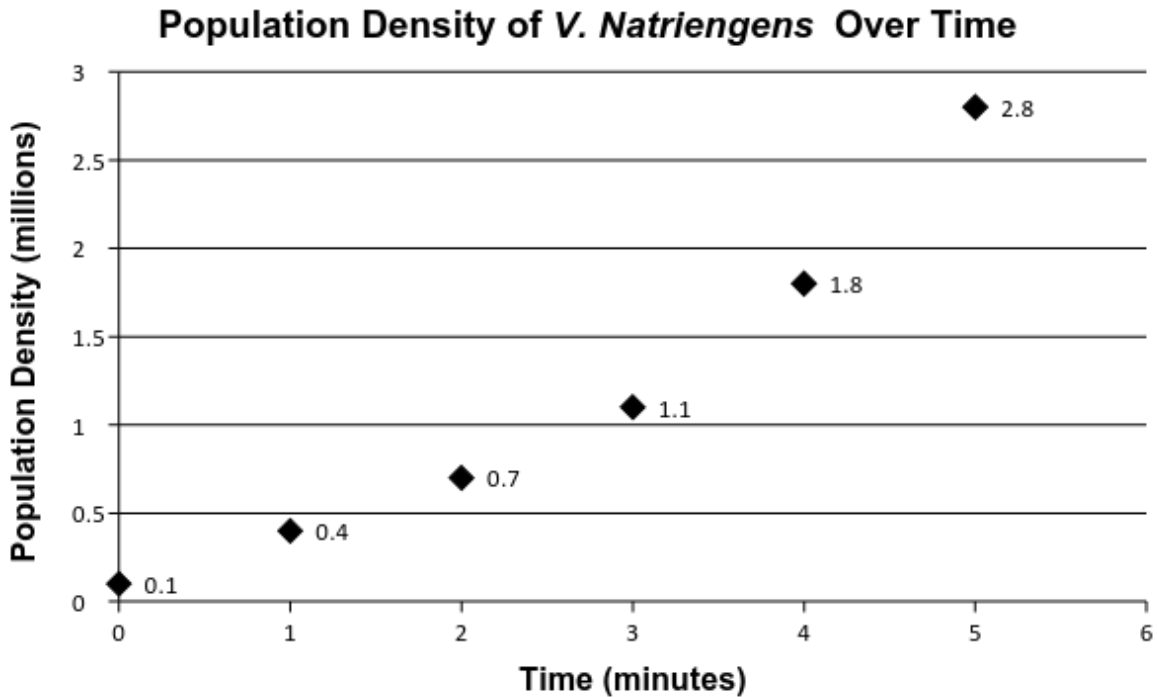
6. Create a data table in the space below based on the graph above.

Time, Min (x)	0	1	2	3	4	5
Population Density, Millions (y)						

7. Why do you think the curved line did not start at the origin?

8. When did the population exceed 1 million bacteria?

9. When do you think the population will exceed 3 million bacteria?

10. Do you see any patterns in the data?