

Lesson 5 Practice Problems

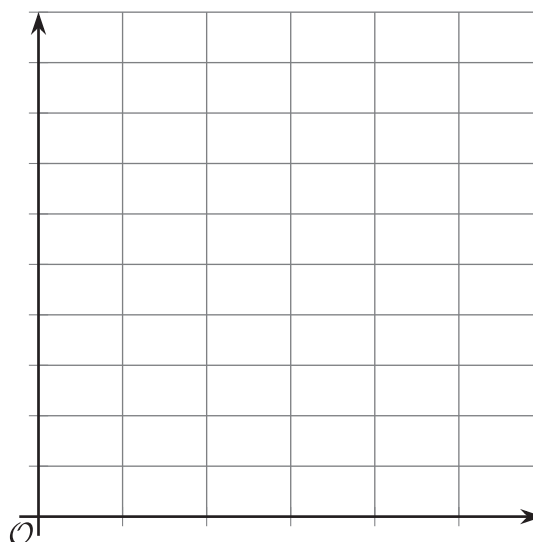
1. A population p of migrating butterflies satisfies the equation $p = 100,000 \cdot \left(\frac{4}{5}\right)^w$ where w is the number of weeks since they began their migration.

a. Complete the table with the population after different numbers of weeks.

w	0	1	2	3	4
p					

b. Graph the butterfly population.

Think carefully about how to choose a scale for the axes.

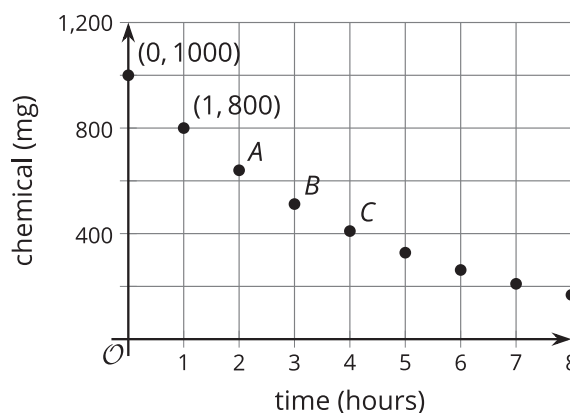


c. What is the vertical intercept of the graph? What does it tell you about the butterfly population?

d. About when does the butterfly population reach 50,000?

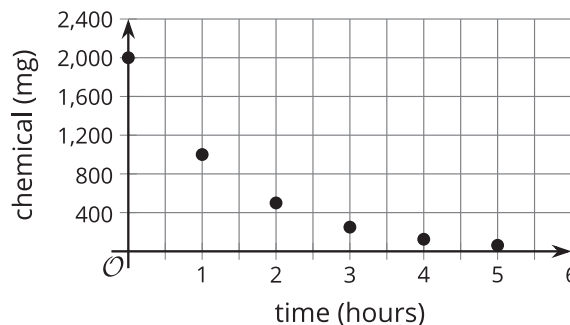
2. The graph shows the amount of a chemical in a water sample. It is decreasing exponentially.

Find the coordinates of the points labeled *A*, *B*, and *C*. Explain your reasoning.



3. The graph shows the amount of a chemical in a water sample at different times after it was first measured.

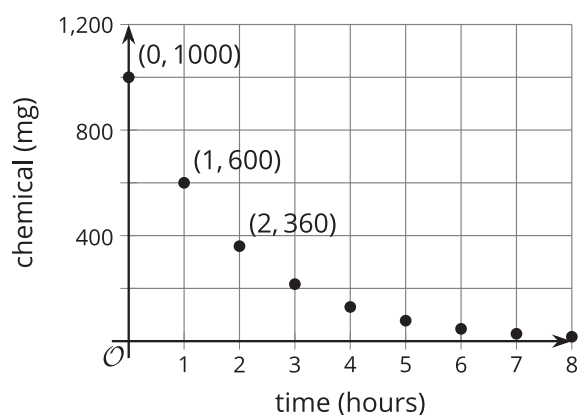
Select **all** statements that are true.



- A. The amount of the chemical in the water sample is decreasing exponentially.
- B. The amount of the chemical in the water sample is not decreasing exponentially.
- C. It is not possible to tell for certain whether or not the amount of the chemical is decreasing exponentially.
- D. When it was first measured, there were 2,000 mg of the chemical in the water sample.
- E. After 4 hours, there were 100 mg of the chemical in the water.

4. The graph shows the amount of a chemical in a patient's body at different times measured in hours since the levels were first checked.

Could the amount of this chemical in the patient be decaying exponentially? Explain how you know.



5. The height of a plant in mm is 7. It doubles each week. Select **all** expressions that represent the height of the plant, in mm, after 4 weeks.

- A. $7 + 4 \cdot 2$
- B. $7 \cdot 2^4$
- C. $2 + 7^4$
- D. $7 \cdot 2 \cdot 2 \cdot 2 \cdot 2$
- E. $7 \cdot 2 \cdot 4$

(From Unit 5, Lesson 2.)

6. The number of people who have read a new book is 300 at the beginning of January. The number of people who have read the book doubles each month.

a. Use this information to complete the table.

number of months since January	number of people who have read the book
0	
1	
2	
3	
4	

b. What do you notice about the difference in the number of people who have read the book from month to month?

c. What do you notice about the factor by which the number of people changes each month?

d. At the beginning of a month, n people have read the book. How many people will have read the book at the beginning of the next month?

(From Unit 5, Lesson 2.)

7. Solve each system of equations.

a.
$$\begin{cases} x + y = 2 \\ -3x - y = 5 \end{cases}$$

b.
$$\begin{cases} \frac{1}{2}x + 2y = -13 \\ x - 4y = 8 \end{cases}$$

(From Unit 2, Lesson 13.)