Lesson 7 Practice Problems

1. A forest fire has been burning for several days. The burned area, in acres, is given by the equation $y = (4{,}800) \cdot 2^d$, where d is the number of days since the area of the fire was first measured.

   a. Complete the table.

   b. Look at the value of $y = 4{,}800 \cdot 2^d$ when $d = -1$. What does it tell you about the area burned in the fire? What about when $d = -3$?

d, days since first measurement	y, acres burned since fire started
0	
-1	
-2	
-3	
-5	

   c. How much area had the fire burned a week before it measured 4,800 acres? Explain your reasoning.

2. The value of a home in 2015 was $400,000. Its value has been doubling each decade.

   a. If v is the value of the home, in dollars, write an equation for v in terms of d, the number of decades since 2015.

   b. What is v when $d = -1$? What does this value mean?

   c. What is v when $d = -3$? What does this value mean?

3. A fish population, p, can be represented by the equation $p = 800 \cdot \left(\frac{1}{2}\right)^t$ where t is time in years since the beginning of 2015.

   What was the fish population at the beginning of 2012?

   A. 100

   B. 800

   C. 2,400

   D. 6,400

4. The area, A, of a forest, in acres, is modeled by the equation $A = 5{,}000 \cdot \left(\frac{5}{4}\right)^d$ where d is the number of decades since the beginning of the year 1950.

   a. Is the area of the forest increasing or decreasing with time? Explain how you know.

   b. What was the area of the forest in 1950?

   c. What was the area of the forest in 1940?

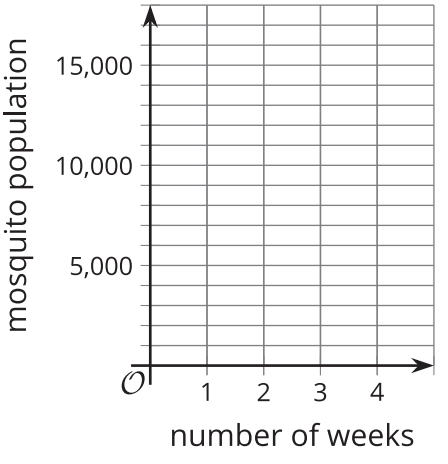
   d. Was the area of the forest less than 1,000 acres in 1900? Explain how you know.

5. A population of mosquitos p is modeled by the equation $p = 1{,}000 \cdot 2^w$ where w is the number of weeks after the population was first measured.

   a. Find and plot the mosquito population for $w = 0, 1, 2, 3, 4$.

   b. Where on the graph do you see the 1,000 from the equation for p?

   c. Where on the graph can you see the 2 from the equation?



(From Unit 5, Lesson 3.)

6. The number of copies of a book sold the year it was released was 600,000. Each year after that, the number of copies sold decreased by $\frac{1}{2}$.

   a. Complete the table showing the number of copies of the book sold each year.

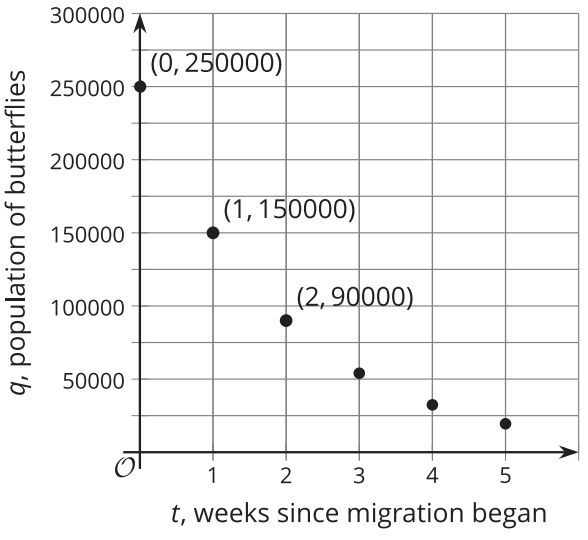
   b. Write an equation representing the number of copies, c, sold y years after the book was released.

   c. Use your equation to find c when $y = 6$. What does this mean in terms of the book?

years since published	number of copies sold
0	
1	
2	
3	
y	

(From Unit 5, Lesson 4.)

7. The graph shows a population of butterflies, t weeks since their migration began.



a. How many butterflies were in the population when they started the migration? Explain how you know.

b. How many butterflies were in the population after 1 week? What about after 2 weeks?

c. Write an equation for the population, q, after t weeks.

(From Unit 5, Lesson 5.)