Lesson 3 Practice Problems

1. Select **all** solutions to $m \cdot m \cdot m = 729$.

   A. $\sqrt{729}$

   B. $\frac{729}{3}$

   C. $\frac{\sqrt{729}}{3}$

   D. $\frac{1}{3}\sqrt{729}$

   E. $729^{\frac{1}{3}}$

   F. $\sqrt[3]{729}$

2. In a pond, the area that is covered by algae doubles each week. When the algae was first spotted, the area it covered was about 12.5 square meters.

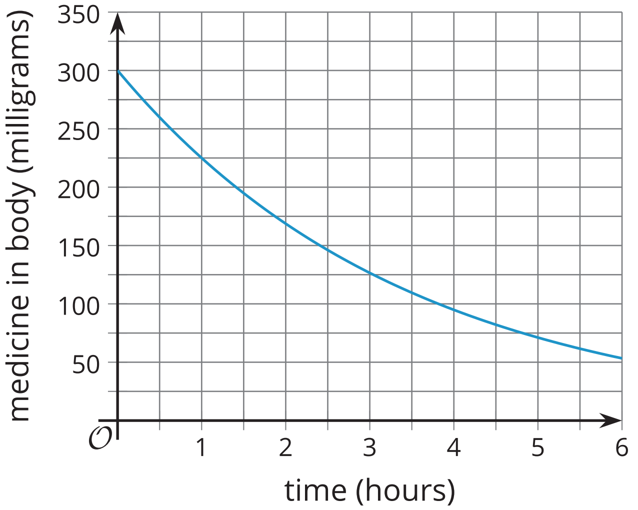
   a. Find the area, in square meters, covered by algae 10 days after it was spotted. Show your reasoning.

   b. Explain why we can find the area covered by algae 1 day after it was spotted by multiplying 12.5 by $\sqrt[7]{2}$.

3. The function m, defined by $m(h) = 300 \cdot \left(\frac{3}{4}\right)^h$, represents the amount of a medicine, in milligrams, in a patient's body. h represents the number of hours after the medicine is administered.

   a. What does $m(0.5)$ represent in this situation?

   b. This graph represents the function m. Use the graph to estimate $m(0.5)$.



   c. Suppose the medicine is administered at noon. Use the graph to estimate the amount of medicine in the body at 4:30 p.m. on the same day.

4. The area covered by a lake is 11 square kilometers. It is decreasing exponentially at a rate of 2 percent each year and can be modeled by $A(t) = 11 \cdot (0.98)^t$.

   a. By what factor does the area decrease in 10 years?

   b. By what factor does the area decrease each month?

5. The third and fourth numbers in an exponential sequence are 100 and 500. What are the first and second numbers in this sequence?

   (From Unit 4, Lesson 1.)

6. The population of a city in thousands is modeled by the function $f(t) = 250 \cdot (1.01)^t$ where t is the number of years after 1950. Which of the following are predicted by the model? Select **all** that apply.

   A. The population in 1950 was 250.

   B. The population in 1950 was 250,000.

   C. The population grows by 1 percent each year.

   D. The population in 1951 was 275,000.

   E. The population grows exponentially.

   (From Unit 4, Lesson 2.)