

## Lesson 5 Practice Problems

1. The table shows the monthly revenue of a business rising exponentially since it opened an online store.

months since online store opened	monthly revenue in dollars
0	72,000
1	
3	90,000
4	
6	112,500

- Describe how the monthly revenue is growing.
- Write an equation to represent the revenue,  $R$ , as a function of months,  $m$ , since the online store opened.
- Find the monthly revenue 1 month after the online store opened. Record the value in the table. Explain your reasoning.
- Explain how we can use the value of  $R(1)$  to find  $R(4)$ .

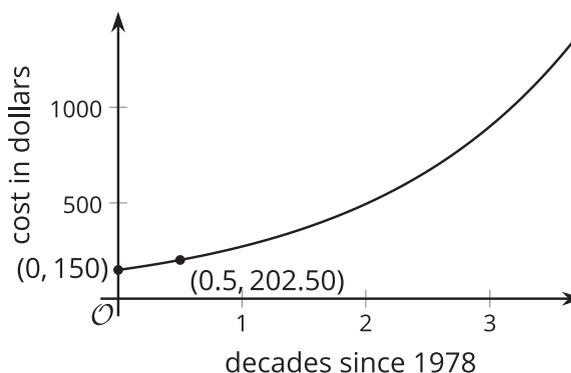
2. At 7 a.m., a colony of 100 bacteria is placed on a petri dish where the population will triple every 6 hours.

Select **all** statements that are true about the bacteria population.

- A. When the bacteria population reaches 900, 12 hours have passed since the colony was placed on the petri dish.
- B. Three hours after the colony is placed on the petri dish, there are 200 bacteria.
- C. Three hours after the colony is placed on the petri dish, there are about 173 bacteria in the colony.
- D. In the first hour the colony is placed on the petri dish, the population grows by a factor of  $3^{\frac{1}{6}}$ .
- E. Between 8 a.m. and 9 a.m., the population grows by a factor of  $3^{\frac{2}{3}}$ .

3. The graph represents the cost of a medical treatment, in dollars, as a function of time,  $d$ , in decades since 1978.

Find the cost of the treatment, in dollars, when  $d = 1$ . Show your reasoning.



4. The exponential function  $f$  is given by  $f(x) = 3^x$ .
- By what factor does  $f$  increase when the exponent  $x$  increases by 1? Explain how you know.
  - By what factor does  $f$  increase when the exponent  $x$  increases by 2? Explain how you know.
  - By what factor does  $f$  increase when the exponent  $x$  increases by  $\frac{1}{2}$ ? Explain how you know.
5. A piece of paper has area 93.5 square inches. How many times does it need to be folded in half before the area is less than 1 square inch? Explain how you know.

(From Unit 4, Lesson 1.)

6. The area covered by an invasive tropical plant triples every year. By what factor does the area covered by the plant increase every month?

(From Unit 4, Lesson 4.)