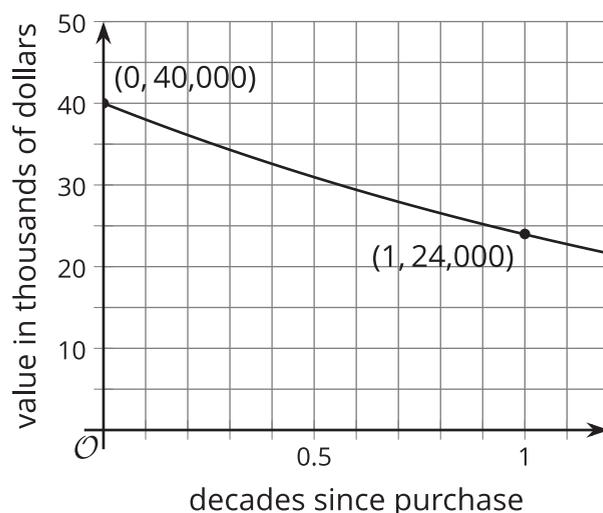


## Lesson 4 Practice Problems

1. A bacteria population is tripling every hour. By what factor does the population change in  $\frac{1}{2}$  hour? Select **all** that apply.
  - A.  $\sqrt{3}$
  - B.  $\frac{3}{2}$
  - C.  $\sqrt[3]{2}$
  - D.  $3^{\frac{1}{2}}$
  - E.  $3^2$
  
2. A medication has a half-life of 4 hours after it enters the bloodstream. A nurse administers a dose of 225 milligrams to a patient at noon.
  - a. Write an expression to represent the amount of medication, in milligrams, in the patient's body at:
    - i. 1 p.m. on the same day
  
    - ii. 7 p.m. on the same day
  
  - b. The expression  $225 \cdot \left(\frac{1}{2}\right)^{\frac{5}{2}}$  represents the amount of medicine in the body some time after it is administered. What is that time?
  
3. The number of employees in a company has been growing exponentially by 10% each year. By what factor does the number of employees change:
  - a. Each month?
  - b. Every 3 months?
  - c. Every 20 months?

4. The value of a truck decreases exponentially since its purchase. The two points on the graph shows the truck's initial value and its value a decade afterward.



- Express the car's value, in dollars, as a function of time  $d$ , in decades, since purchase.
- Write an expression to represent the car's value 4 years after purchase.
- By what factor is the value of the car changing each year? Show your reasoning.

5. The value of a stock increases by 8% each year.

- Explain why the stock value does not increase by 80% each decade.
- Does the value increase by more or less than 80% each decade?

6. Decide if each statement is true or false.

a.  $50^{\frac{1}{2}} = 25$

b.  $\sqrt{30}$  is a solution to  $y^2 = 30$ .

c.  $243^{\frac{1}{3}}$  is equivalent to  $\sqrt[3]{243}$ .

d.  $\sqrt{20}$  is a solution to  $m^4 = 20$ .

(From Unit 4, Lesson 3.)

7. Lin is saving \$300 per year in an account that pays 4.5% interest per year, compounded annually. About how much money will she have 20 years after she started?

A. \$545.45

B. \$3,748.78

C. \$9,411.43

D. \$1,124,634.54

(From Unit 2, Lesson 26.)