

## Lesson 4 Practice Problems

1. A new bicycle sells for \$300. It is on sale for  $\frac{1}{4}$  off the regular price. Select all the expressions that represent the sale price of the bicycle in dollars.

- A.  $300 \cdot \frac{1}{4}$
- B.  $300 \cdot \frac{3}{4}$
- C.  $300 \cdot (1 - \frac{1}{4})$
- D.  $300 - \frac{1}{4}$
- E.  $300 - \frac{1}{4} \cdot 300$

2. A computer costs \$800. It loses  $\frac{1}{4}$  of its value every year after it is purchased.

- a. Complete the table to show the value of the computer at the listed times.
- b. Write an equation representing the value,  $v$ , of the computer,  $t$  years after it is purchased.
- c. Use your equation to find  $v$  when  $t$  is 5. What does this value of  $v$  mean?

time (years)	value of computer (dollars)
0	
1	
2	
3	
$t$	

3. A piece of paper is folded into thirds multiple times. The area,  $A$ , of the piece of paper in square inches, after  $n$  folds, is  $A = 90 \cdot \left(\frac{1}{3}\right)^n$ .
- What is the value of  $A$  when  $n = 0$ ? What does this mean in the situation?
  - How many folds are needed before the area is less than 1 square inch?
  - The area of another piece of paper in square inches, after  $n$  folds, is given by  $B = 100 \cdot \left(\frac{1}{2}\right)^n$ . What do the numbers 100 and  $\frac{1}{2}$  mean in this situation?
4. At the beginning of April, a colony of ants has a population of 5,000.
- The colony decreases by  $\frac{1}{5}$  during April. Write an expression for the ant population at the end of April.
  - During May, the colony decreases again by  $\frac{1}{5}$  of its size. Write an expression for the ant population at the end of May.
  - The colony continues to decrease by  $\frac{1}{5}$  of its size each month. Write an expression for the ant population after 6 months.
5. Lin has 13 mystery novels. Each month, she gets 2 more. Select **all** expressions that represent the total number of Lin's mystery novels after 3 months.
- $13 + 2 + 2 + 2$
  - $13 \cdot 2 \cdot 2 \cdot 2$
  - $13 \cdot 8$
  - $13 + 6$
  - 19

(From Unit 5, Lesson 2.)

6. An *odometer* is the part of a car's dashboard that shows the number of miles a car has traveled in its lifetime. Before a road trip, a car odometer reads 15,000 miles. During the trip, the car travels 65 miles per hour.

a. Complete the table.

b. What do you notice about the differences of the odometer readings each hour?

c. If the odometer reads  $n$  miles at a particular hour, what will it read one hour later?

duration of trip (hours)	odometer reading (miles)
0	
1	
2	
3	
4	
5	

(From Unit 5, Lesson 2.)

7. A group of students is collecting 16 oz and 28 oz jars of peanut butter to donate to a food bank. At the end of the collection period, they donated 1,876 oz of peanut butter and a total of 82 jars of peanut butter to the food bank.
- Write a system of equations that represents the constraints in this situation. Be sure to specify the variables that you use.
  - How many 16 oz jars and how many 28 oz jars of peanut butter were donated to the food bank? Explain or show how you know.

(From Unit 2, Lesson 12.)

8. A function multiplies its input by  $\frac{3}{4}$  then adds 7 to get its output. Use function notation to represent this function.

(From Unit 4, Lesson 4.)

9. A function is defined by the equation  $f(x) = 2x - 5$ .

- What is  $f(0)$ ?
- What is  $f(\frac{1}{2})$ ?
- What is  $f(100)$ ?
- What is  $x$  when  $f(x) = 9$ ?

(From Unit 4, Lesson 4.)