Lesson 1 Practice Problems

1. Here are a few pairs of positive numbers whose sum is 50.

    a. Find the product of each pair of numbers.

    b. Find a pair of numbers that have a sum of 50 and will produce the largest possible product.

    c. Explain how you determined which pair of numbers have the largest product.

| first number	second number	product
1	49	
2	48	
10	40	

2. Here are some lengths and widths of a rectangle whose perimeter is 20 meters.

    a. Complete the table. What do you notice about the areas?

length (meters)	width (meters)	area (square meters)
1	9	
3	7	
5		
7		
9		

    b. Without calculating, predict whether the area of the rectangle will be greater or less than 25 square meters if the length is 5.25 meters.

    c. On the coordinate plane, plot the points for length and area from your table.

    Do the values change in a linear way? Do they change in an exponential way?
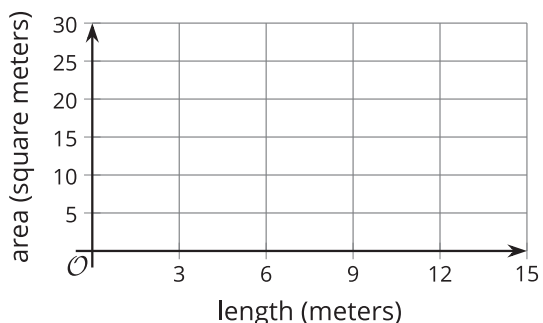
3. The table shows the relationship between x and y, the side lengths of a rectangle, and the area of the rectangle.

   a. Explain why the relationship between the side lengths is linear.

   b. Explain why the relationship between x and the area is neither linear nor exponential.

x (cm)	y (cm)	area (sq cm)
2	4	8
4	8	32
6	12	72
8	16	128

4. Which statement best describes the relationship between a rectangle's side length and area as represented by the graph?
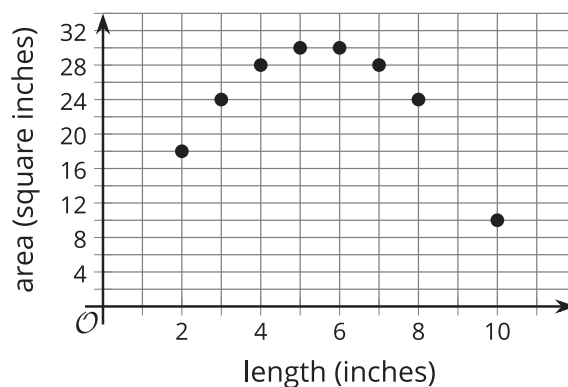
   A. As the side length increases by 1, the area increases and then decreases by an equal amount.

   B. As the side length increases by 1, the area increases and then decreases by an equal factor.

   C. As the side length increases by 1, the area does not increase or decrease by an equal amount.

   D. As the side length increases by 1, the area does not change.

5. Copies of a book are arranged in a stack. Each copy of a book is 2.1 cm thick.

   a. Complete the table.

   b. What do you notice about the differences in the height of the stack of books when a new copy of the book is added?

copies of book	stack height in cm
0	
1	
2	
3	
4	

   c. What do you notice about the factor by which the height of the stack of books changes when a new copy is added?

   d. How high is a stack of b books?

(From Unit 5, Lesson 2.)

6. The value of a phone when it was purchased was $500. It loses $\frac{1}{5}$ of its value a year.

   a. What is the value of the phone after 1 year? What about after 2 years? 3 years?

   b. Tyler says that the value of the phone decreases by $100 each year since $\frac{1}{5}$ of 500 is 100. Do you agree with Tyler? Explain your reasoning.

(From Unit 5, Lesson 4.)

7. *Technology required.* The data in the table represents the price of one gallon of milk in different years.

Use graphing technology to create a scatter plot of the data.

a. Does a linear model seem appropriate for this data? Why or why not?

b. If it seems appropriate for the data, create the line of best fit. Round to two decimal places.

c. What is the slope of the line of best fit, and what does it mean in this context? Is it realistic?

d. What is the y-intercept of the line of best fit, and what does it mean in this context? Is it realistic?

x, time (years)	price per gallon of milk (dollars)
1930	0.26
1935	0.47
1940	0.52
1940	0.50
1945	0.63
1950	0.83
1955	0.93
1960	1.00
1965	1.05
1970	1.32
1970	1.25
1975	1.57
1985	2.20
1995	2.50
2005	3.20
2018	2.90
2018	3.25

(From Unit 3, Lesson 5.)

8. Give a value for r that indicates that a line of best fit has a negative slope and models the data well.

(From Unit 3, Lesson 7.)