Lesson 2 Practice Problems

1. A population of ants is 10,000 at the start of April. Since then, it triples each month.

    a. Complete the table.

    b. What do you notice about the population differences from month to month?

    c. If there are n ants one month, how many ants will there be a month later?

months since April	number of ants
0	
1	
2	
3	
4	

2. A swimming pool contains 500 gallons of water. A hose is turned on, and it fills the pool at a rate of 24 gallons per minute. Which expression represents the amount of water in the pool, in gallons, after 8 minutes?

    A. $500 \cdot 24 \cdot 8$

    B. $500 + 24 + 8$

    C. $500 + 24 \cdot 8$

    D. $500 \cdot 24^8$

3. The population of a city is 100,000. It doubles each decade for 5 decades. Select **all** expressions that represent the population of the city after 5 decades.

    A. 32,000

    B. 320,000

    C. $100{,}000 \cdot 2 \cdot 2 \cdot 2 \cdot 2 \cdot 2$

    D. $100{,}000 \cdot 5^2$

    E. $100{,}000 \cdot 2^5$

4. The table shows the height, in centimeters, of the water in a swimming pool at different times since the pool started to be filled.

minutes	height
0	150
1	150.5
2	151
3	151.5

   a. Does the height of the water increase by the same amount each minute? Explain how you know.

   b. Does the height of the water increase by the same factor each minute? Explain how you know.

5. Bank account C starts with $10 and doubles each week. Bank account D starts with $1,000 and grows by $500 each week.

   When will account C contain more money than account D? Explain your reasoning.

   (From Unit 5, Lesson 1.)

6. Suppose C is a rule that takes time as the input and gives your class on Monday as the output. For example, $C(10{:}15) = \text{Biology}$.

   a. Write three sample input-output pairs for C.

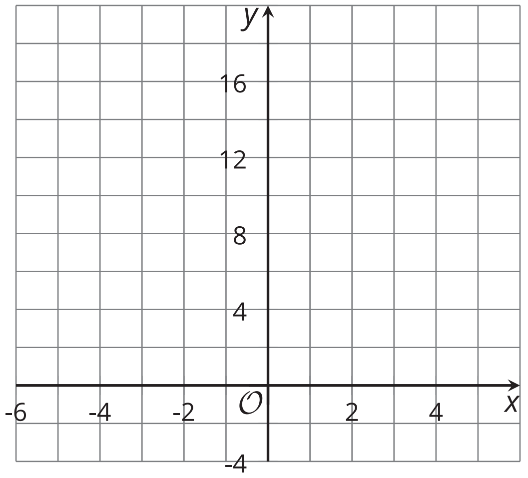
   b. Does each input to C have exactly one output? Explain how you know.

   c. Explain why C is a function.

   (From Unit 4, Lesson 2.)

7. The rule that defines function f is $f(x) = x^2 + 1$. Complete the table. Then, sketch a graph of function f.

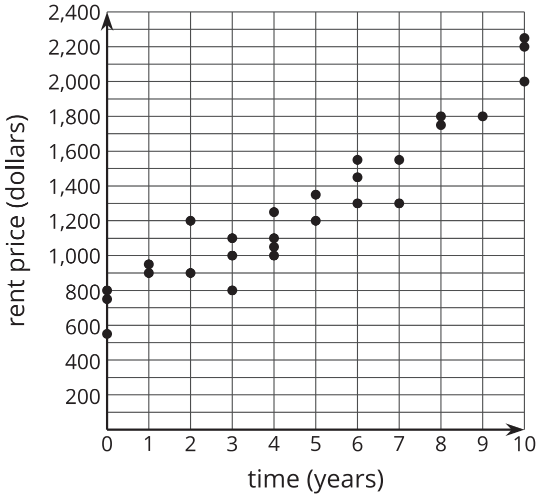
x	$f(x)$
-4	17
-2	
0	
2	
4	



(From Unit 4, Lesson 4.)

8. The scatter plot shows the rent prices for apartments in a large city over ten years.

   a. The best fit line is given by the equation $y = 134.02x + 655.40$, where y represents the rent price in dollars, and x the time in years. Use it to estimate the rent price after 8 years. Show your reasoning.



   b. Use the best fit line to estimate the number of years it will take the rent price to equal $2,500. Show your reasoning.

(From Unit 3, Lesson 4.)