

# Assignment

## Write

Explain why all sequences can be described as functions.

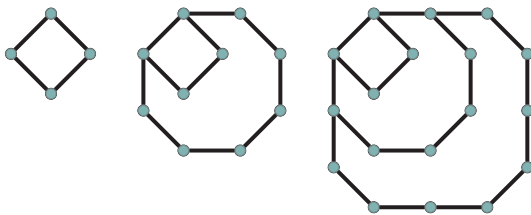
## Remember

A sequence is a pattern involving an ordered arrangement of numbers, geometric figures, letters, or other objects. All numeric sequences can be represented as functions.

## Practice

Consider the three sequences given. For each sequence, describe the pattern. Then, represent the sequence as a numeric sequence and as a table of values, including the first 6 terms.

### 1. Matchstick Mayhem



### 2. Hancox Homes

Hancox Homes is a popular construction company that builds affordable housing. When the company first started, they sold 1 home the first month, 3 homes the second month, 9 homes the third month, and 27 homes the fourth month.

### 3. Violet's Videos

Violet is a yoga instructor who regularly posts new exercise videos on a website for her clients. One week after launching the website, she had posted a total of 6 videos. At the end of week 2, she had a total of 10 videos. At the end of week 3, she had a total of 14 videos. At the end of week 4, she had a total of 18 videos.

## Stretch

### Robin's Restaurant

Robin is opening a restaurant and tells her staff they have to go above and beyond to please their customers, especially on opening day. She reasons that if one customer is pleased with the restaurant, that person is likely to tell 4 people about it. Then each of those people is likely to tell 4 people about it, and so on.

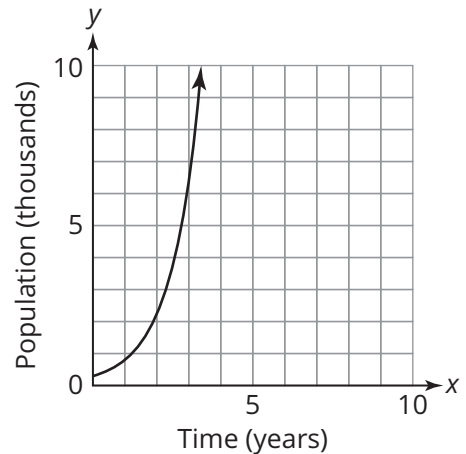
- Describe the pattern for the number of customers Robin's Restaurant will reach with each telling.
- Determine how many customers are reached after the 5th, 6th, and 7th tellings.
- Represent the number of customers reached with each telling as a numeric sequence. Then represent the sequence using a table of values.
- Identify the appropriate function family for the function. Then describe whether the function is continuous or discrete.

## Review

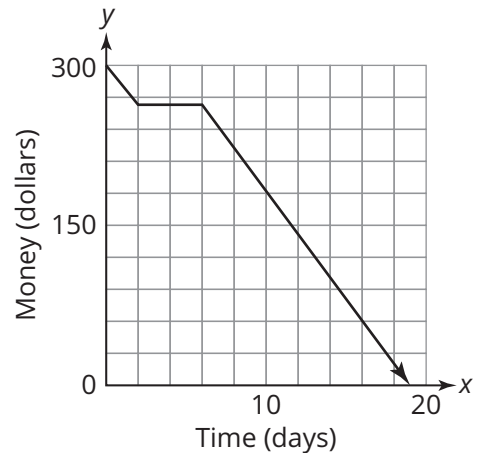
1. For each scenario and graph:

- Identify the appropriate function family.
- Describe the domain based on the problem situation.
- Identify the graphical behavior of the function as increasing, decreasing, or a combination.

a. A city discovers that its population has been tripling every year. The function graphed models the population (in thousands) after  $x$  years.



b. A vacationer has \$300 to spend over the next 20 days. The first two days, she spends \$20 on food each day. She visits with family members for the next four days and does not spend any money. She then spends \$20 on transportation on each of the remaining days until she spends all of her money. The function graphed models the amount of money left after  $x$  days.



2. Determine whether each data set represents a function.

a.  $\{(-5, 8), (-6, 2), (-2, -6), (-1, 8), (4, 6)\}$

b.

$x$	$y$
2	9
6	8
4	7
2	4
8	2