



# Describing Patterns

Let's explore visual patterns.

## 2.1 Continue the Pattern

Consider a list that starts  $1, \frac{5}{2}, \dots$ . What would be the next three numbers in the list, if it followed a pattern that grew:

1. exponentially?
2. linearly?

## 2.2 Patterns of Sticks

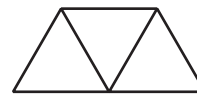
1. Here's a pattern.



step 0



step 1



step 2

- a. How do you see the pattern changing?
- b. Extend the pattern to show your prediction of the next two steps.

2. Here are tables that represent the pattern.

step	0	1	2	3	6	11	$n$
	3	5	7				

step	0	1	2	3	6	11	$n$
	3	4	5		9		

- In each pattern, what quantity is represented in the second row?
  - Complete each table.
  - Describe each pattern as linear, exponential, or neither. Be prepared to explain how you know.
3. Here is another pattern.



- Lin says that step 3 will have 8 segments. Andre says that step 3 will have 7 segments. How does each student see the pattern growing?
- Complete the tables to show the relationship between step number and number of segments, as Lin and Andre would see it.
- Describe each pattern as linear, exponential, or neither. Be prepared to explain how you know.

**Lin**

step	0	1	2	3	6	9	$n$
number of segments	1	2	4				

**Andre**

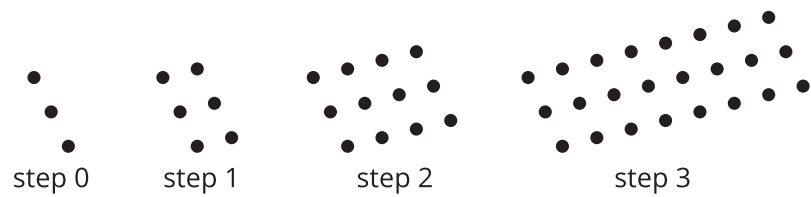
step	0	1	2	3	6	9
number of segments	1	2	4			



2.3

Patterns of Dots

1. Here is a pattern of dots.



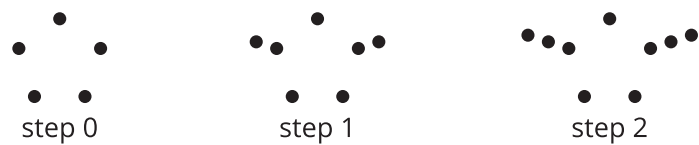
- a. Describe how you see the pattern growing.
- b. Draw the next step.

c. Complete the table to continue the pattern.

step	0	1	2	3	4	6	$n$
number of dots	3	6					

- d. Is the relationship between step number and number of dots linear, exponential, or neither? Explain how you know.

2. Here is another pattern of dots.



- a. Describe how you see the pattern growing.
- b. Draw the next step.

c. Complete the table to continue the pattern.

step	0	1	2	3	4	6	$n$
number of dots	5	7					

- d. Is the relationship between step number and number of dots linear, exponential, or neither? Explain how you know.