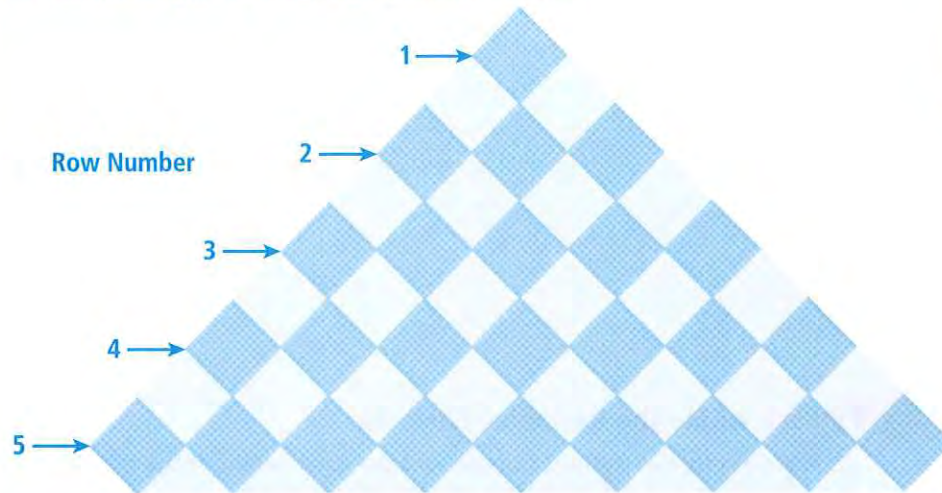


**EXPLORE & REASON**

A fashion designer is designing a patterned fabric.



A. Copy and complete.

Row number	1	2	3	4	5
Number of Patterned Squares in the Row	1	□	5	□	□
Total Number of Patterned Squares	1	□	9	□	□

B. **Use Structure** What number patterns do you see in the rows of the table? © MP.7

**HABITS OF MIND**

**Model with Mathematics** What information would you need from the table to write a linear equation that represents the pattern? Explain. © MP.4

**EXAMPLE 1**  **Try It! Connect Sequences and Functions**

1. Is the domain of the function in Part B of Example 1 continuous or discrete? Explain.

**EXAMPLE 2**  **Try It! Apply the Recursive Formula**

2. Write a recursive formula to represent the total height of the  $n$ th stair above the ground if the height of each stair is 18 cm.

**EXAMPLE 3**  **Try It! Apply the Explicit Formula**

3. The cost to rent a bike is \$28 for the first day plus \$2 for each day after that. Write an explicit formula for the rental cost for  $n$  days. What is the cost of renting the bike for 8 days?

**HABITS OF MIND**

**Reason** Can a recursive formula have a negative common difference? Explain. © MP.2

**EXAMPLE 4** **Try It! Write an Explicit Formula From a Recursive Formula**

4. Write an explicit formula for each arithmetic sequence.

a.  $a_n = a_{n-1} - 3; a_1 = 10$

b.  $a_n = a_{n-1} + 2.4; a_1 = -1$

**EXAMPLE 5** **Try It! Write a Recursive Formula From an Explicit Formula**

5. Write a recursive formula for each explicit formula.

a.  $a_n = 8 + 3n$

b.  $a_n = 12 - 5n$

**HABITS OF MIND**

**Communicate Precisely** Explain how you can use the recursive formula to find the value of any term in an arithmetic sequence. © MP.6

## Do You UNDERSTAND?

1.  **ESSENTIAL QUESTION** How are arithmetic sequences related to linear functions?

2. **Error Analysis** A student uses the explicit formula  $a_n = 5 + 3(n - 1)$  for the sequence 3, 8, 13, 18, 23, . . . to find the 12th term. Explain the error the student made. © MP.3

3. **Vocabulary** When is a *recursive formula* more useful than an *explicit formula* for an arithmetic sequence?

4. **Communicate Precisely** Compare and contrast a recursive formula and an explicit formula for an arithmetic sequence. © MP.6

## Do You KNOW HOW?

Tell whether or not each sequence is an arithmetic sequence.

5. 15, 13, 11, 9, . . .

6. 4, 7, 10, 14, . . .

Write a recursive formula for each sequence.

7. 81, 85, 89, 93, 97, . . .

8. 47, 39, 31, 23, 15, . . .

9. An online store charges \$5 to ship one box and \$10 to ship two boxes. Write an explicit formula for an arithmetic sequence to represent the amount the online store pays to ship  $n$  boxes. Use the explicit formula to determine how much the online store charges when shipping 11 items.