

MAIN IDEA

- Extend and describe arithmetic sequences using algebraic expressions.

BUILD YOUR VOCABULARY (pages 144–145)

A **sequence** is a list of numbers in a specific order. Each number in the list is called a **term** of the sequence.

A sequence is an **arithmetic sequence** if each term can be found by adding the same number to the previous term.

EXAMPLE Describe Sequences

- 1** Use words and symbols to describe the value of each term as a function of its position. Then find the value of the tenth term in the sequence.

Position	1	2	3	4	n
Value of Term	7	14	21	28	■

Notice that the value of each term is its position number. So, the value of the term in position n is .

Position	Multiply by 7	Value of Term
1	$1 \times 7 =$	7
2	$2 \times 7 =$	14
3	$3 \times 7 =$	21
4	$4 \times 7 =$	28
n	$n \times 7 =$	$7n$

Now find the value of the tenth term.

$$7n = 7 \cdot \text{} \quad \text{Replace } n \text{ with } \text{}.$$

$$= \text{} \quad \text{Multiply.}$$

The value of the tenth term in the sequence is .

Check Your Progress

Use words and symbols to describe the value of each term as a function of its position. Then find the value of the tenth term in the sequence.

Position	1	2	3	4	n
Value of Term	9	18	27	36	■

EXAMPLE Make a Table

1 TIME There are 60 seconds in 1 minute. Make a table and write an algebraic expression relating the number of seconds to the number of minutes. Then find how many seconds it takes Shaila to walk to school if it takes her 9 minutes.

Notice that the number of minutes times 60 gives the number of seconds. So, to find how long it takes Shaila to walk to school, use the expression

□

$$60n = 60 \cdot \text{□} \quad \text{Replace } n \text{ with } \text{□}.$$

$$= \text{□} \quad \text{Multiply.}$$

Minutes	Seconds
1	<div style="border: 1px solid black; width: 60px; height: 25px;"></div>
2	<div style="border: 1px solid black; width: 60px; height: 25px;"></div>
3	<div style="border: 1px solid black; width: 60px; height: 25px;"></div>
4	<div style="border: 1px solid black; width: 60px; height: 25px;"></div>
n	<div style="border: 1px solid black; width: 60px; height: 25px;"></div>

So, it takes Shaila to walk to school.

Check Your Progress

TIME There are 24 hours in 1 day. Make a table and write an algebraic expression relating the number of hours to the number of days. Then find how many hours Hayden has to finish his science project if he has exactly 6 days.

EXAMPLE

TEST EXAMPLE The table shows the number of plants in a garden, based on the number of rows. Which expression was used to find the number of plants in n rows?

- A $n + 3$ C $3n$
 B $n - 3$ D $3n + 1$

Number of Rows	Number of Plants
1	4
2	7
3	10
4	13
n	■

Read the Item To find the expression, determine the function.

Solve the Item Notice that the values 4, 7, 10, 13, ... increase by , so the rule contains $3n$. Therefore, choices and can be eliminated.

If the rule were simply $3n$, then the value for position 1 would be 3×1 or 3. But this value is 4. So, choice can be eliminated.

This leaves choice . Test a few values.

Row 1: $3n + 1 = 3(1) + 1 =$

Row 3: $3n + 1 = 3(3) + 1 =$

So, the answer is .

Check Your Progress

MULTIPLE CHOICE The table shows the number of students allowed to go on a field trip based on the number of adults accompanying them. Which expression was used to find the number of students for n adults?

- F $n - 1$ H $n + 5$
 G $5n - 1$ J $5n$

Number of Adults	Number of Students
1	4
2	9
3	14
4	19
n	■

HOMEWORK ASSIGNMENT

Page(s):

Exercises: