Arithmetic Sequences

**Example 1**  
**Extending Number Patterns**

Use inductive reasoning to describe each pattern. Then find the next two numbers in each pattern.

a. \(9, 15, 21, 27, \ldots\)

b. \(3, 9, 27, 81, \ldots\)

c. \(2, -4, 8, -16, \ldots\)

You try...

a. \(1, 5, 9, \ldots\)  
b. \(1, 9, 25, 49, \ldots\)

A number pattern is also called a ______________________. Each number in a sequence is a _____________ of the sequence. One kind of number sequence is an ________________ sequence. You form an arithmetic sequence by adding a fixed number to each previous term. This fixed number is called the ________________.

**Example 2**  
**Finding the Common Difference**

Find the common difference of each arithmetic sequence.

a. \(11, 23, 35, 47, \ldots\)  
b. \(8, 3, -2, -7, \ldots\)

You try...

a. \(5, 2, -1, -4, \ldots\)  
b. \(8, 11, 14, 17, \ldots\)
How are arithmetic sequences like the function rules we have been finding?

Write a RULE for the arithmetic sequence 9, 15, 21, 27, ...

**Example 3** Finding Terms of a Sequence

Find the first, sixth, and twelfth terms of each sequence.

a. 14, 11, 8, . . .

b. 25, 32, 39, 46, . . .

You try...

Given: -4, -1, 2, 5  
Find: $A_3$, $A_{10}$, $A_{50}$

Given: $A_n = 5n + -1$  
Find: The first 1st 5 terms of the sequence.