

Section 4-7 Arithmetic Sequences

Students will be able to:
 -identify and expand patterns in sequences
 -represent arithmetic sequences using functional notation.

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A sequence is an ordered list of numbers that often forms a pattern.

Each number in the list is called the term of the sequence.

Describe the pattern. What are the next 2 terms?

4, ⁻³12, ³36, . . .
 • Mult by 3
 • 108, 324

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Describe a pattern in each sequence. What are the next 2 terms?

5, 11, 17, 23, . . .
 +6
 29
 35
 400, 200, 100, 50, . . .
 mult by 1/2
 25, 12.5

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In an arithmetic sequence, the difference between consecutive terms is constant. This is called the common difference.

Is the sequence arithmetic? What is the common difference?

10, 4, -2, -8, . . .
 Yes cd = -6
 2, -2, 2, -2, . . .

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*A recursive formula is a function rule that relates each term of the sequence to the term before it.

Write the recursive formula and find the 9th term.

3, 9, 15, 21, . . .

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In general:

recursive formula names the first term and then shows how to change for the following terms.

5, 10, 15, 20, . . .
 * $A(1) = \text{1st term}$
 * $A(n) = A(n-1) + \text{common difference}$
 $A(1) = 5$
 $A(n) = A(n-1) + 5$
 $A(1) = 6$
 $A(n) = A(n-1) + 6$

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An explicit formula is a function rule that relates each term of a sequence to the term number.

$$* A(n) = A(1) + (n - 1)d$$

nth term 1st term term # common difference

$$10, 6, 2, \dots \quad d = -4 \quad A(n) = 10 + (n-1)(-4)$$

Write the explicit formula from the recursive formula:

$$A(n) = A(n - 1) + 2; A(1) = 21$$

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Writing a recursive formula from an explicit formula.

If the explicit formula is $A(n) = 76 + (n - 1)(10)$

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Hwk: pg. 279
 #10, 16, 18 - 30 (4th),
 38, 42, 46, 48, 56, 70,
 75 (a, b only), 82, 86, 87

Quiz tomorrow over 4.4-4.7

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