

Worksheet: Sequences

- I. For each of the sequences described in subscript notation below, follow these steps.
1. Substitute a number for n into the given equation to write an equation for a_{40} .
 2. Create a table with the position number in the first column and the term in the second column, showing the first 5 terms of the sequence.
 3. Determine whether or not the given pattern is recursive.
- a. $a_n = -n$.
 - b. $a_{n+1} = 4 + 3n^2 + a_n$, and $a_0 = 4$.
 - c. $a_{n+2} = a_{n+1} + 2 * a_n$ and $a_0 = 1, a_1 = 1$.
 - d. $a_n = 2a_{n-1}$ and $a_0 = 3$.
- II. For each of the sequences described in words below, follow these steps.
1. Create a table with the position number in the first column and the term in the second column, showing the first 5 terms of the sequence.
 2. Write several examples of the pattern using subscript notation.
 3. Write a formula for each term of the sequence, using subscript notation, with a variable subscript.
 4. Determine whether or not your formula is recursive.
- a. Each term of the sequence is found by adding 5 to the preceding term. The starting term is 3.
 - b. Each term of the sequence is found by multiplying the preceding term by $1/2$. The starting term is 80.
 - c. Each term of the sequence is found by multiplying the position number by 7 and adding 3 to the result.
 - d. Each term of the sequence is found by multiplying its position number by the preceding term. The starting term is 1.
- III. For each of the given sequences below, follow these steps.
1. Create a table with the position number in the first column and the term in the second column.
 2. Find a pattern, and use it to find the next three terms of the sequence.
 3. Write a verbal description of your pattern.
 4. Write several examples of the pattern using subscript notation.
 5. Write a formula for the terms in the sequence using subscript notation, with a variable subscript.
 6. Determine whether or not your formula is recursive.
- a. 3, 6, 9, 12, 15, ...
 - b. 1, 4, 9, 16, 25, 36, ...
 - c. 5, 8, 11, 14, 17, ...
 - d. 1, 10, 100, 1000, ...
 - e. $1/2, 1/3, 1/4, 1/5, \dots$
 - f. $1/2, 2/3, 3/4, 4/5, \dots$
 - g. 5, 55, 555, 5555, 55555, ...
 - h. 1, 2, 6, 12, 20, 30, ...