**Sequences**

A **sequence** is an ordered set of numbers. Example: {2, 4, 6, 8}

Sometimes a sequence can continue without ever stopping. This is what we would call an **infinite sequence**.

For now we will deal with **finite sequences** which are sequences that have a limited number of terms.

In your own words, write a definition for each of the three things mentioned above.

**Sequence** – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Infinite Sequence** – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Finite Sequence** – \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

One of the things you’ll be asked to do is to find the terms of a sequence. To do this you’ll be given an equation. Let’s look at two different types of examples.

**Finding Terms of a Sequence Using a Recursive Formula**

What does recursive mean? Well a **recursive formula** is a formula in which one or more previous terms are used to generate the next term in the sequence.

**Example #1**

Find the first 5 terms of the sequence.

, 

The first term is given, 5. Now use that first term to find the second term (a2). The following table should help you figure out the first 5 terms. Some of the table has already been filled in. Use the information to fill in the rest.

|  |  |  |
| --- | --- | --- |
| n |  |  |
| 1 | Given | 5 |
| 2 | 2(5) + 1 | 11 |
| 3 | 2(11) + 1 |  |
| 4 |  |  |
| 5 |  |  |

What are the first 5 terms of the sequence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Answer: 5, 11, 23, 47, 95)

**Finding Terms of a Sequence Using an Explicit Formula**

What does explicit mean? Well an **explicit formula** is a formula that defines the *n*th term of a sequence as a function of n. Basically it’s a formula where we don’t need to know what any of the previous terms are to find the rest of the sequence.

**Example #1**

Find the first 5 terms of the sequence.



Just as before, use the table to help you find the first 5 terms of the sequence.

|  |  |  |
| --- | --- | --- |
| n |  |  |
| 1 | 3(1) – 5 | -2 |
| 2 | 3(2) – 5 | 1 |
| 3 | 3(3) – 5 |  |
| 4 |  |  |
| 5 |  |  |

What are the first 5 terms of the sequence? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(Answer: -2, 1, 4, 7, 10)

You should now be able to say you can do the following things:

* I can tell the difference between an explicit and recursive formula. (A1)
* I can find several terms of a sequence using a recursive formula. (A2)
* I can find several terms of a sequence using an explicit definition. (A3)

**Assignment: Worksheet + pg 865 #2-10, 16-21**