



Introduction

Recursive Sequence

A sequence in which each new term is defined in relation to previous terms.

The formula has two parts; (1) the initial condition, and (2) the recursive equation.

Example

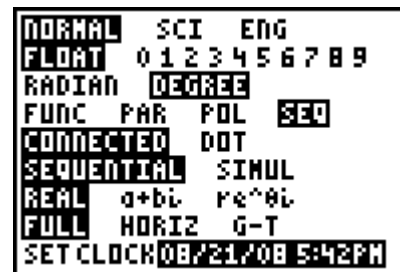
$$a_1 = 3 \quad \text{(initial condition)}$$

$$a_n = a_{n-1} + 2 \quad \text{(recursive equation)}$$

- Write a verbal description of the sequence in the example above.
- Show how you would find the 2nd and 3rd terms of this sequence by hand.

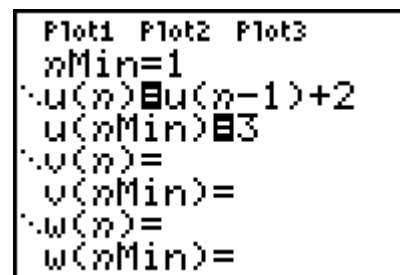
Problem 1 – Generating a recursive sequence

To explore sequences, the calculator needs to be set to sequence mode by pressing the **MODE** key and selecting **SEQ**.



To generate the sequence in the example above, press **Y=** and match the screen to the right.

Note: enter **n** by pressing **X,T,θ,n** and enter **u** by pressing **2nd****7**.



To view this sequence, press **2nd****GRAPH**.

- What are the first 10 terms?



Recursive Sequences

Now it's your turn. Have your graphing calculator generate a sequence with an initial value of 3 so that the next term is one less than the previous term.

Formula	First 10 Terms

Generate a sequence with an initial value of -3 so that the next term is five more than the twice the previous term.

Formula	First 10 Terms

Problem 2 – Writing a Recursive Equation

Below are two sequences. Write a recursive formula for each sequence. Use your graphing calculator to check if your formulas are correct.

Sequence 1	Sequence 2
$-2, -3.5, -5, -6.5, -8, -9.5$	$0, 3, -6, 21, -60, 183$
Formula	Formula

- Explain how you determined the recursive formulas.