Recursive Sequences

ID: 10988

Activity Overview

In this activity, students will use the Spreadsheet application to generate recursive sequences and then examine the values. They will also write recursive sequence formulas for given sequences.

Topic: Sequences, Series & Functions

- *Recursive formulas*
- *Initial term*
- *Recurrence relation*

Teacher Preparation and Notes

- *Teacher should read the activity and transfer the .tns file to the student calculators.*
- *Teacher should practice writing sequences using the dialogue box in the spreadsheet application.*
- *This activity can be completed without the worksheet.*
- *Use (ctrl) + (tab) to move between applications on the pages with split screens.*
- ***To download the student and solution TI-Nspire documents (.tns files) and student worksheet, go to education.ti.com/exchange and enter "10987" in the quick search box.***

Associated Materials

- *RecursiveSeq_Student.doc*
- *RecursiveSeq.tns*
- *RecursiveSeq_Soln.tns*

Suggested Related Activities

To download any activity listed, go to education.ti.com/exchange and enter the number in the quick search box.

- *Arithmetic Sequences & Series (TI-84 Plus) — 8642*
- *Geometric Sequences & Series (TI-Nspire technology) — 8674*
- *Spreading Doom (TI-Nspire technology) — 10074*

Problem 1 – Generating Recursive Sequences

The first few pages are an introduction to recursive sequences giving the students the definition, explaining the parts of the formula, and showing an example.

Students are to write a verbal explanation of the example sequence and then determine the 2nd and 3rd term of the sequence by hand.
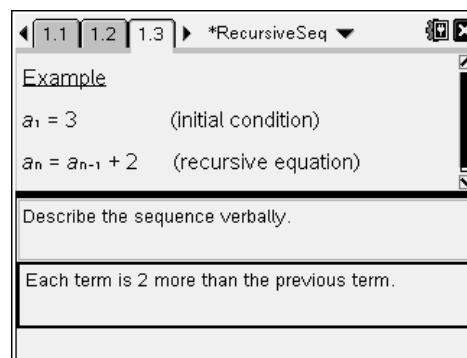
Page 1.5 contains directions for creating a sequence using the *Lists & Spreadsheet* application. You may want to demonstrate to students how to generate the terms of the example sequence on page 1.6.

> To create a sequence, press **MENU > Data > Generate Sequence**. A dialogue box will appear. Enter the information as shown at the right.
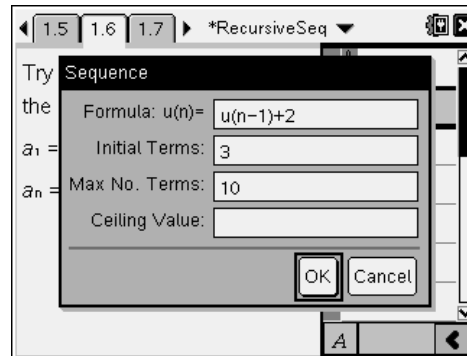
Note that a_{n-1} needs to be input as **u(n–1)**.

Students are to complete pages 1.7 and 1.8 independently. They need to type their formula on the left side of the screen before generating the sequence.

To enter a_{n-1}, students can copy it from another page ((ctrl)+ C) and then paste it ((ctrl) + V) where needed.
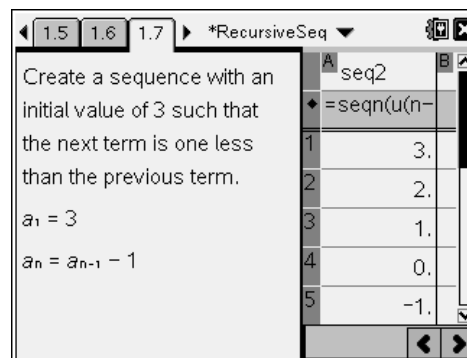
Problem 2 – Writing a Recursive Equation

On page 3.2, terms for two sequences are given. Students are to determine a recursive formula for each sequence. They will need to arrow to the right in the spreadsheet to see the second sequence.

To confirm that they have the right formula, students should use the **Generate Sequence** command in Column B (to check **seq4**) and Column D (to check **seq5**).

Students should then explain how they determined the formulas.