



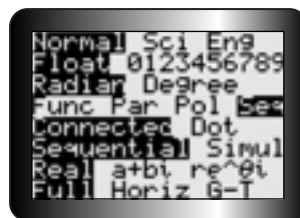
Part 1: Creating a Table and Graphing — The General Term

Using the TI-83 Plus calculator, you can first create a table for a sequence and then graph. You will need the general term.

Create and graph the sequence defined by $t_n = 3n - 1$.

1. Change the graphing mode from function to sequence.

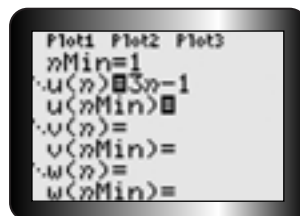
The graphing modes are listed on the fourth line of the MODE menu. Press **[MODE]** and scroll down and across to Seq. Press **[ENTER]**.



step 1

2. Enter the general term into the sequence editor.

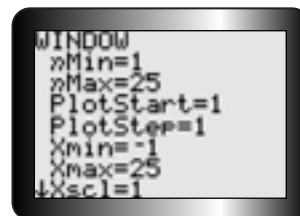
Press **[Y=]**. In this editor, $u(n)$, $v(n)$, and $w(n)$ represent the general terms of sequences. You can change the minimum value of n ($n\text{Min}$). In most cases, you will not need to change the value 1, because, when $n = 1$, the first term is generated. Scroll down to $u(n)$ and position the cursor to the right of the equal sign. Press **[3]** **[X,T,θ,n]** **[−]** **[1]**.



step 2

3. Adjust the window to display the required number of terms.

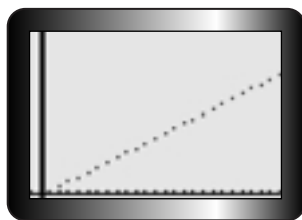
Press **[WINDOW]**. The setting $n\text{Min}$ indicates the smallest n -value for the calculator to evaluate, while $n\text{Max}$ indicates the largest n -value for the calculator to evaluate. $\text{PlotStart}=1$ means that the graph starts at the first term. $\text{PlotStep}=1$ means that each consecutive term will be plotted. You can change these settings, but use these window settings for this example.



step 3

4. Graph the sequence.

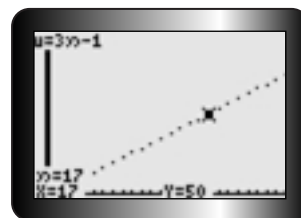
Press **[GRAPH]**.



step 4

5. Trace along the graph to identify specific terms of the sequence.

Press **TRACE**. Use **▶** and **◀** to move from point to point. The n -value, or position, and the x - and y -coordinates of each term are displayed at each point. The y -coordinate represents the value of the term.



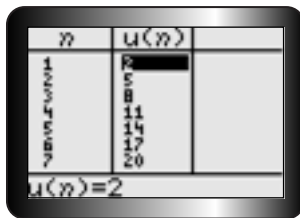
step 5

6. View the terms of the sequence in a table.

- (a) Press **2nd** **WINDOW**. Set **TblStart** to 1 and **ΔTbl** to 1.
- (b) Press **2nd** **GRAPH** to display the table. Use the cursor keys to scroll through the table.



step 6a



step 6b

Note: To see the graph and the table at the same time, use split-screen mode. Press **MODE**, then scroll down and across to **G-T** (on the last line of the **MODE** menu). Press **ENTER** **GRAPH**.

Part 2: Creating a Table and Graphing — The Recursive Formula

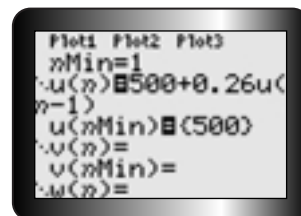
Using the TI-83 Plus calculator, you can graph recursive sequences in the same way, with one exception: you must specify an initial value or values for $u(nMin)$ in the sequence editor.

Graph the sequence $t_1 = 500$, $t_n = 500 + 0.26t_{n-1}$.

1. Enter the recursive formula in the sequence editor and set the initial value.

Press **Y=**. Then, for the sequence $u(n)$, press **5** **0** **0** **+** **0** **.** **2** **6** **2nd** **7** **(** **X,T,Θ,n** **-** **1** **)**.

Set the initial value to 500. Position the cursor to the right of the equal sign for $u(nMin)$ and press **2nd** **(** **5** **0** **0** **2nd** **)** **ENTER**.

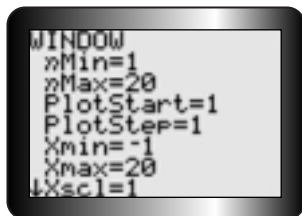


step 1

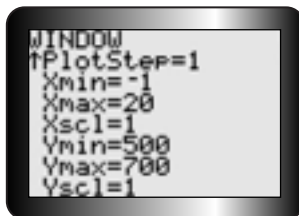
Note: You do not have to enter the braces (**2nd** **(** and **2nd** **)**) around the initial value, or the first term. However, if you were to enter, for example, $t_1 = 0$ and $t_2 = 1$, then you would press **2nd** **(** **1** **,** **0** **2nd** **)**.

2. Set the window.

Press **WINDOW** and enter the values shown.

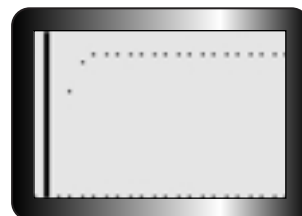


step 2



3. Draw the graph.

Press **GRAPH**.



step 3

4. View the terms of the sequence in a table.

Press **2nd** **WINDOW**. Set TblStart to 1 and ΔTbl to 1. Press **2nd** **GRAPH** to display the table. Use the cursor keys to scroll through the table.



step 4

n	$u(n)$
1	500
2	630
3	663.8
4	672.59
5	674.87
6	675.47
7	675.62

$u(n)=500$

Practice 1.4

Part 1

- Graph the first 25 terms of each sequence.
- Determine the 10th, 15th, and 20th terms of each sequence.
- Check your answers. Use either **TRACE** or look at the table (**2nd** **GRAPH**).

- (a) $t_n = 6n + 3$ (b) $t_n = n^2$ (c) $t_n = \frac{1}{n}$ (d) $t_n = \sqrt{n}$
 (e) $t_n = 2n^3 - n$ (f) $t_n = -n$ (g) $t_n = 10(1.1)^n$ (h) $t_n = 10(2)^{-n}$

Part 2

- Graph the first ten terms of each recursive sequence.
- Determine the fifth and tenth terms of each sequence.
- Check your answers. Use either **TRACE** or look at the table (**2nd** **GRAPH**).

- (a) $t_n = t_{n-1} + 4, t_1 = 3$ (b) $t_n = 5t_{n-1}, t_1 = 6$
 (c) $t_n = -2t_{n-1} + 3, t_1 = 5$ (d) $t_n = 2t_{n-1}, t_1 = 2$
 (e) $t_n = \frac{1}{2}(t_{n-1}), t_1 = 100$ (f) $t_n = t_{n-1} - t_{n-2}, t_1 = 5, t_2 = 7$