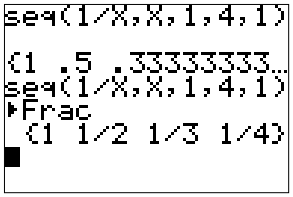
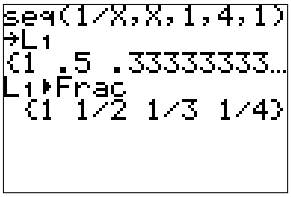
TI Lab 9: Sequences and Series

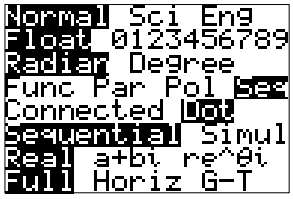
In this lab, you will: generate a list of terms in a sequence;
find the sum of a finite number of terms in a sequence;
graph a sequence; and
use a program that finds the sum of finite terms of a geometric series.

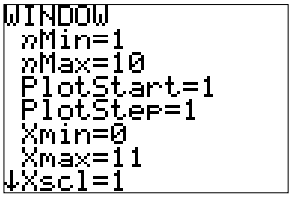
1. Your calculator can generate terms of a sequence easily and quickly. Go to the `LIST` menu (`2nd STAT`) and over to `OPS`. Choice 5 is the sequence command. The format for the sequence command is `seq(`*sequence, variable, start, end, increment*`)`, where *start* and *end* refer to the term numbers and *increment* tells the calculator how to count from start number to end number. For instance, the first 4 terms of the sequence $1/n$ are given in the figure below. Note that you can change the sequence to fractions and store the sequence as a list.

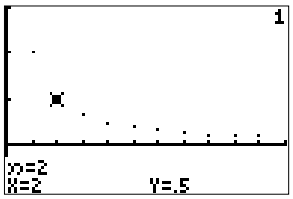


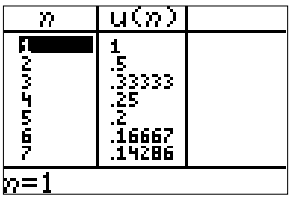


2. Your calculator can also graph terms in a sequence. To do this, your calculator's `MODE` must be `Seq` and `Dot`. When you press the `Y=` button, you get the screen shown below. `nMin` is the starting value of `n` and `u(n)` is the sequence. The window screen is different as well. In addition to the x and y scales, you have `nMin`, `nMin`, `PlotStart` and `PlotStep`. Clearly, the range of `n` values you wish to graph is `nMin` and `nMax`. `PlotStart` is the `n` value you wish to begin graphing and `PlotStep` is the increment. Finally, pressing the graph button produces a graph over which you may trace values. The table is also available in `Seq` mode as well.

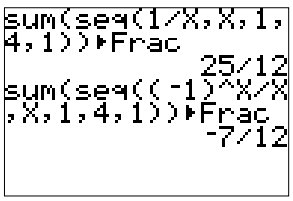


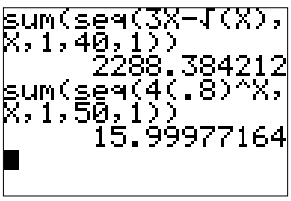






3. To find the sum of some finite amount of terms, go to the `LIST` menu and over to `MATH`. Choice 5 is sum. The figure below shows the format to obtain the sum of terms in a sequence.





4. The program `SERIES` combines the summing and graphing features in one program—however, it is only good for geometric sequences. Here, we run the program on the geometric sequence $\{4(0.8)^n\}$. The advantage to using this program is that it will give you the value of the infinite sum (if the geometric series converges), and it graphs the partial sums so that you may observe the convergence or divergence of the series.