

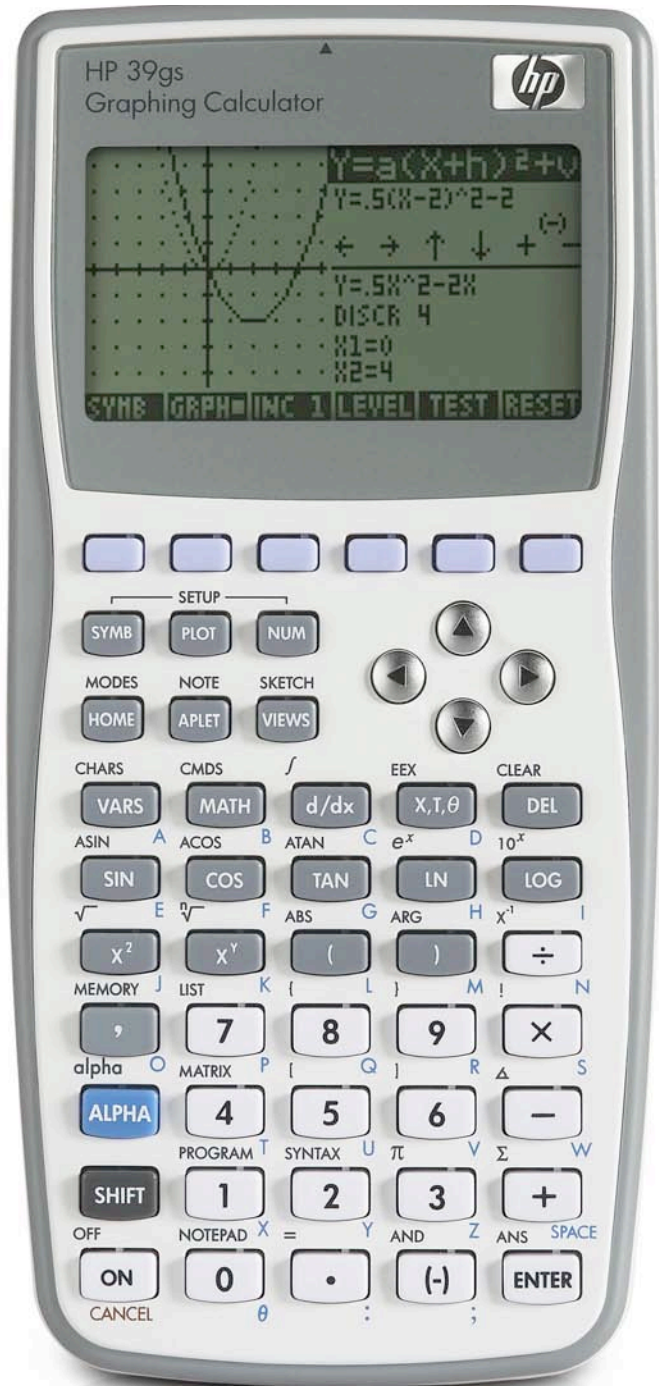


hp calculators

HP 39gs Putting Sequences to work

Recursive vs. non-recursive

How do I find the value of S_n ?



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Recursive vs. non-recursive

Each definition U1, U2... U0 in the Sequence aplet has three components – term 1, term 2 and the general term U_n .

A sequence can be defined recursively, as shown in the two examples on the below, so that the general definition refers back to previous terms.

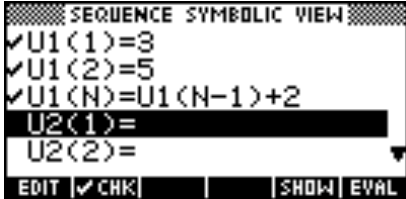


Figure 1

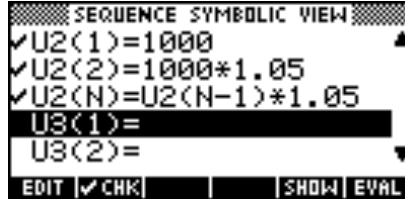


Figure 2

Entering recursive sequences is made easier through the provision of short-cut keys. These appear on the screen keys (circled below) but only when you are typing in the general term. In the Fibonacci sequence shown, entering $U3(N-1)+U3(N-2)$ took only 5 keystrokes!

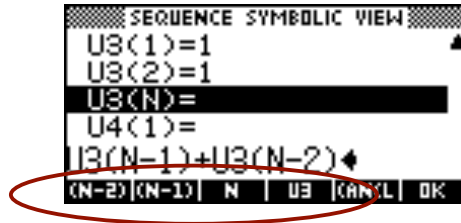


Figure 3

Changing to the NUM view allows you to view the sequence. To jump to any term you can scroll down or just type it into the N column and press ENTER.

N	U1	U2	U3
1	3	1000	1
2	5	1050	1
3	8	1102.5	2
4	13	1157.625	3
5	21	1215.50625	5
6	34	1276.2828125	8

Figure 4

N	U1	U2	U3
250	501	1.8886E8	7.896E51
251	503	1.983E8	1.278E52
252	505	2.0822E8	2.067E52
253	507	2.1863E8	3.345E52
254	509	2.2956E8	5.412E52
255	511	2.4104E8	8.757E52

Figure 5

Note: If you enter values for the first two terms that are not consistent with the general term then this will not be regarded as an error. The calculator simply assumes that you know what you are doing and that the first two terms are supposed to be different!

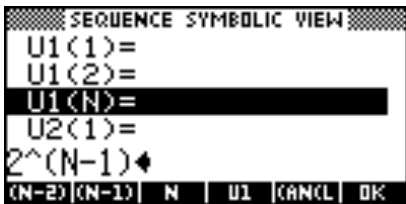


Figure 6

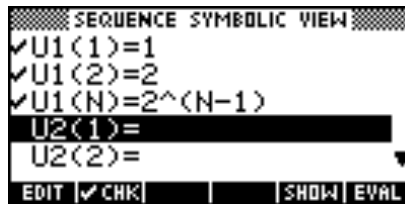


Figure 7

How do I find the value of S_n ?

Find the sum of the first 20 terms of the sequence 100, 105, 110.25...

Although the hp 39gs does not offer access to the sum of sequence (series) terms directly it is very easy to set this up.

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HP 39gs Putting sequences to work

Just set up your sequence terms U_n as one sequence (see below for an example) and then as your second sequence, enter the first term and second term of the series. In this case they are $U2(1)=100$ and $U2(2)=100+100*1.05$

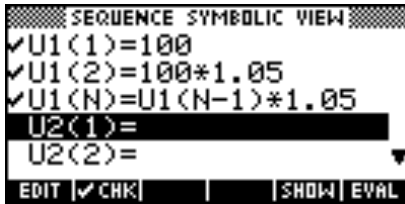


Figure 8

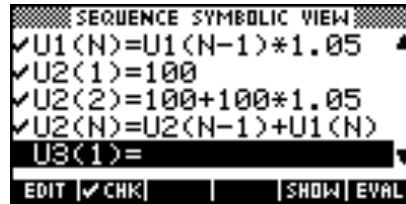


Figure 9

Note that there is no need to evaluate them. Now enter the general term of the series as $U2(N)=U2(N-1)+U1(N)$. Note also the reference to both sequences contained in the formula. Changing to the NUM view will now let you view the sequence and its series. Finding S_{20} is a matter of scrolling down.

N	U1	U2	
1	100	100	
2	105	205	
3	110.25	315.25	
4	115.7625	431.0125	
5	121.5506	552.5631	
6	127.6282	680.1913	

At the bottom of the screen, there are menu options: ZOOM | | BIG | DEFN |

Figure 10

N	U1	U2	
15	197.9932	2157.856	
16	207.8928	2365.749	
17	218.2875	2584.037	
18	229.2018	2813.238	
19	240.6619	3053.9	
20	252.695	3306.595	

Below the table, the sum S_{20} is displayed as 3306.59541029. At the bottom of the screen, there are menu options: ZOOM | | BIG | DEFN |

Figure 11