

Directions for using the TI-83/84 to compute sums

- Change your calculator to the sequence mode:
 - Type **[MODE]**
 - Use the arrow keys to move to the fourth line and highlight **Seq** and press **[ENTER]**
 - Type **[2nd] [QUIT]**
- Go to the **List Menu** by typing **[2nd] [LIST]**
 - Choose the **Math** submenu
 - Choose option **5: sum (** to paste this command in the home screen.
- Go to the List Menu by typing **[2nd] [LIST]**
 - Choose the **OPS** submenu
 - Choose option **5: seq (** to paste this command in the home screen.
You should see **sum(seq(** on your home screen.
- Enter the terms that you want to sum.
The syntax is **sum(seq(sequence_def, variable, first_value_of_n, last_value_of_n))**

Enter the following exactly as shown **sum(seq(1/n^2,n,1,10)) [ENTER]**

This should return the value 1.549767731 Enter this value in the table.

This will compute the following: $\sum_{n=1}^{10} \frac{1}{n^2} = 1 + \frac{1}{4} + \frac{1}{9} + \frac{1}{16} + \frac{1}{25} + \frac{1}{36} + \frac{1}{49} + \frac{1}{64} + \frac{1}{81} + \frac{1}{100}$

To avoid re-typing all of this each time you change the *last_value_of_n* or the *sequence_def*, use the **[ENTRY]** button as follows:

- Type **[2nd] [ENTRY]** and this will paste your last entry into the home screen.
[i.e. You should now see **sum(seq(1/n^2,n,1,10))** again on the home screen.]

- Use the arrow keys to place your cursor over the 0 in the 10.
- Type **[2nd] [INSERT] [0]** to insert another zero to make 100. Press **[ENTER]**

Now it will compute $\sum_{n=1}^{100} \frac{1}{n^2}$. Enter the resulting value in the table.

- Repeat this process to change the *last_value_of_n* to be 500 and 999 and enter the resulting sums in the table.

[Notes:

The more terms you sum, the longer it will take – be patient.

The TI-83 will only let you compute up to 999 terms otherwise you will get an error.

If you get see **ERR:OVERFLOW** that means the number computed is too big for the calculator. Enter option **1:Quit** and move on.]

- Type **[2nd] [ENTRY]** and this will paste your last entry into the home screen.
 - Use the arrow keys and the **[DEL]** and **[2nd] [INS]** buttons to change the line to be **sum(seq(1/n,n,1,10))**
 - Repeat the steps above to compute the sums for *last_value_of_n* = 10, 100, 500, 999

Repeat the process as necessary to compute the sums for all of the sequences given in the lab.

Here is the syntax for each sum in the lab (last value of $n=10$) (pay attention to parentheses).

Series/Sum: $\sum_{n=1}^{10} \frac{1}{n^2}$	sum(seq(1/n^2,n,1,10))	(for sequence: $a_n = \frac{1}{n^2}$)
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Series/Sum: $\sum_{n=1}^{10} \frac{1}{n}$	sum(seq(1/n,n,1,10))	(for sequence: $a_n = \frac{1}{n}$)
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Series/Sum: $\sum_{n=1}^{10} \frac{1}{\sqrt{n}}$	sum(seq(1/√(n),n,1,10))	(for sequence: $a_n = \frac{1}{\sqrt{n}}$)
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Series/Sum: $\sum_{n=1}^{10} \left(\frac{1}{2}\right)^n$	sum(seq(.5^n,n,1,10))	(for sequence: $a_n = \left(\frac{1}{2}\right)^n$)
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Series/Sum: $\sum_{n=1}^{10} \left(-\frac{1}{2}\right)^n$	sum(seq(-.5^n,n,1,10))	(for sequence: $a_n = \left(-\frac{1}{2}\right)^n$)
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Series/Sum: $\sum_{n=1}^{10} 2^n$	sum(seq(2^n,n,1,10))	(for sequence: $a_n = 2^n$)
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Series/Sum: $\sum_{n=1}^{10} \frac{n}{n+1}$	sum(seq(n/(n+1),n,1,10))	(for sequence: $a_n = \frac{n}{n+1}$)
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Series/Sum: $\sum_{n=1}^{10} \frac{n}{n^2+1}$	sum(seq(n/(n^2+1),n,1,10))	(for sequence: $a_n = \frac{n}{n^2+1}$)
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Series/Sum: $\sum_{n=1}^{10} 3$	sum(seq(3,n,1,10))	(for sequence: $a_n = 3$)
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