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**Notes On Using T.I.-82  
Calculators To Find Sums**

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## NOTES ON USING T.I.-82 CALCULATORS TO FIND SUMS

Definition: The set of integers is denoted  $Z$ . (After the German word for number, *Zahl*).

Definition: A *sequence* is the range of a function whose domain is a subset of  $Z$ .

Example: Define  $f(n) = 2n + 1$  for  $n$  in the set  $\{1, 2, 3, 4, 5, \dots\}$ . To determine the sequence produced by  $f$  just plug some of the first few values of the domain.

$f(1) = 3, f(2) = 5, f(3) = 7, f(4) = 9, \dots$  So  $f$  produces all of the odd integers beginning with 3.

We say that the sequence is the set  $\{3, 5, 7, 9, \dots\}$ .

A common kind of question that you have probably seen in your past math classes and on many kinds of standardized tests is "find the next term in the sequence...".

For example find the next term in the sequence  $\{-1, 2, 5, 8, \_, \dots\}$

Find the number was easy. A little harder is coming up with a formula for that sequence, give that a whirl, clearly state what the domain is.

We will use the calculator to produce the numbers in a sequence. Then we can do things like add up all of those numbers. Here's how it works:

The sequence above could be written  $f(n) = 3n - 4$ . Suppose we want to produce all of the values in the sequence for  $n = 1$  to 50. That sequence would be  $\{-1, 2, \dots, 146\}$ . To get all of these numbers in your calculator carry out the following steps:

```
LIST
2nd STAT
```

You will now see this OPS MATII

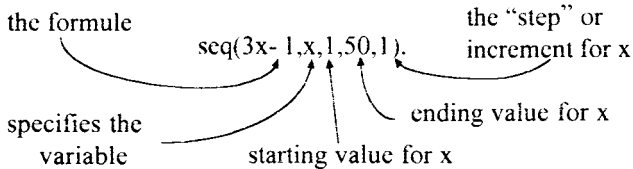
- 1: Sort A(
- 2: Sort D(
- 3: dim

4: Fill (

5: seq(

Select 5: (press the 5 key)

You will now see seq( on the screen. Enter the following:



Now press ENTER. The sequence should appear on your screen. You won't be able to see any of the numbers past '14', unfortunately, but they are in the calculator. To get better access to the numbers in the sequence we need to put them in a better place.

**L1**

Re-enter seq(3x - 1, x, 1, 50, 1), press STO ▶ and then 2nd 1.

You should see this on your calculator:

seq(3z - 1, x, 1, 50, 1) → **L1**... Now press ENTER.

The entire sequence is stored safely in L1, (List 1). To view L1 do the following:

STAT Then, in the menu that appears on the screen, select 1: Edit

You should see this L1      L2      L3

-1

2

5

(There might be some numbers in L2 or L3 from previous work you have done.)

Finding Sums of the terms in a sequence.

Suppose we want to find the sum of all the numbers in List 1:

$$S = -1 + 2 + 5 + \dots + 149.$$

Symbolically we write this as  $S = \sum_{n=1}^{50} (3n - 4)$ . (The symbol  $\Sigma$  is the

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capital Greek letter *sigma*.)

To do this on the calculator, do the following:

LIST

2nd: STAT In the resulting menu, use the ▶ key to select MATH.

From that menu select 5: sum. You will now see sum at the top of the screen; put L1 after it - sum L1 - and press ENTER. The answer should be 3625.