

Chapter 4 / Example 13

Arithmetic sequences

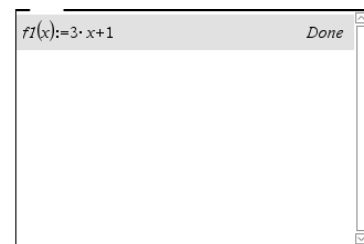
For each of the following arithmetic sequences:

- i State its first term and common difference.
 - ii Find the 10th term of the sequence.
 - iii Determine, giving your reasons, whether 49 is an element of the sequence.
- a** $u_n = 3n + 1, n \in \mathbb{Z}^+$. Remember that \mathbb{Z}^+ is the set of positive integers: $\{1, 2, 3, \dots\}$.
- b** 206, 199, 192, \dots

Open a new document and add a Calculator page.

Type $f1(x) := 3x + 1$ and press **enter**.

To enter, $:=$ press **ctrl** **[=]** (**f:=**).



Press **ctrl** **[doc]** (**f+page**) and add a Lists & Spreadsheet page.

Press **ctrl** **T** to change from a spreadsheet to a table.

Press **enter**.

From the table, $u_1 = 4$.

By subtracting two consecutive terms, $d = 3$.

The calculator screen shows a table with the following data:

x	f1(x):= 3*x+1
1.	4.
2.	7.
3.	10.
4.	13.
5.	16.

Scroll down the table using **▼**.

From the table, $u_{10} = 31$.

The calculator screen shows a table with the following data:

x	f1(x):= 3*x+1
7.	22.
8.	25.
9.	28.
10.	31.
11.	34.

Scroll further down the table using **▼**.

From the table, $u_{16} = 49$.

The calculator screen shows a table with the following data:

x	f1(x):= 3*x+1
14.	43.
15.	46.
16.	49.
17.	52.
18.	55.

Chapter 4 / Example 13

Arithmetic sequences

Press **ctrl** **◀** to return to the Calculator page.

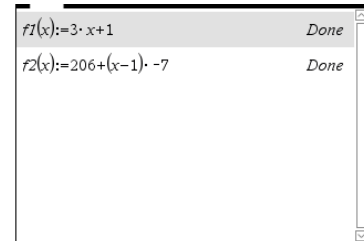
In the sequence, 206, 199, 192, ...

$$u_1 = 206.$$

By subtracting two consecutive terms, $d = -7$.

The sequence is $u_n = 206 + (n - 1)(-7)$.

Type $f2(x) := 206 + (x - 1)(-7)$ and press **enter**.



Press **ctrl** **▶** to return to the Lists & Spreadsheets page.

Press **▶** to move into the second column.

Use the trackpad to select f2.

As stated, $u_1 = 206$ and $d = -7$.

x	f1(x):=	f2(x):=
	3*x+1	206+(x-1.
1.	4.	206.
2.	7.	199.
3.	10.	192.
4.	13.	185.
5.	16.	178.
206.		

Scroll down the table using **▼**.

From the table, $u_{10} = 143$.

x	f1(x):=	f2(x):=
	3*x+1	206+(x-1.
8.	25.	157.
9.	28.	150.
10.	31.	143.
11.	34.	136.
12.	37.	129.
143.		

Scroll further down the table using **▼**.

$$u_{23} = 52 \text{ and } u_{24} = 45.$$

49 is not an element of the sequence as it lies between the two values.

x	f1(x):=	f2(x):=
	3*x+1	206+(x-1.
22.	67.	59.
23.	70.	52.
24.	73.	45.
25.	76.	38.
26.	79.	31.
52.		