Concept – Arithmetic Recursion Relations

A recursion relation is a mathematical way of writing the pattern which is producing a sequence.
A recursion relation lets you calculate _____ in a sequence, where a

recursion rule (which we have looked at previously) lets you calculate _____ in a sequence.
The basic form of a recursion relation for an arithmetic sequence is:

$$t_1 = a, \qquad t_{n+1} = t_n + d$$

How to

To use a recursion relation to calculate terms in an arithmetic sequence.

1. Find the values of _____
2. Substitute these values into the recursion relation formula (above)

3. First calculate _____, then _____ and so on until you have all the terms required.

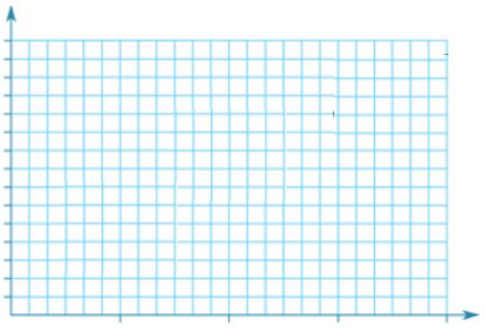
Eg: Macca is saving to go on holidays. He speaks with a bank manager who says that if Macca deposits $2500 with the bank he will earn interest of $45.60 each month.

- Write a recursion relation to represent this situation.

- Using recursion, write the first 6 terms of the sequence and find how much money is in Maccas account after 6 months of saving.

There are times when you will be asked to construct a table and then a graph of a recurrence relation.
To do this start with a table like this:

n	1	2	3	4
t_n				



Then add the points to a graph.

Fill in the table and draw a graph based on the Maccas saving account question above.

Worked Example

Choose an example which requires you to write a recurrence relation, generate a number of terms and make a table and graph.