Concept – Arithmetic Sequences

Arithmetic sequences are generated by adding or subtracting a fixed amount to the previous term.

This fixed amount is known as the _____

To calculate the common difference (d) we can use the equation:

$$d = t_n - t_{(n-1)}$$

To show that (or prove that) a sequence is arithmetic you need to show that the difference between terms is constant.

How to

Eg1: Calculate the common difference in the arithmetic sequence 21, 28, 35, 42, …

Eg2: Show that the sequence 6, 1, -4, -9, … is arithmetic.

There is a simple approach to making arithmetic sequences on your calculator.

a. Start a new  _____ page.

b. Type the first term and press enter.

c. Press _____ then add or subtract the common difference.

d. Continue to press enter to make the next term in the sequence.

Worked Example

Find or make up a sequence. Prove that this sequence is arithmetic and find a late term (t_{10})

Concept – Arithmetic Sequence Applications

If we need to find a term late in the sequence, say t_{50} repeated addition will take a really long time. So coming up with a relation for an arithmetic sequence is a quicker way to work.
The standard form for an arithmetic sequence is

$$t_n = t_1 + (n-1) \times d$$

How to

Eg: Jane deposits $5600 into a savings account. This grows dues to interest payments of $145 per month.

a) Write a rule for the amount of money in the savings account after n months.

b) How much money will Jane have in the savings account after 3 years?

c) If Jane is saving to buy a car which will cost $15 500, how many months will she need to wait?

Worked Example

Choose an example which requires you to write a rule for a sequence and use this to find a term.