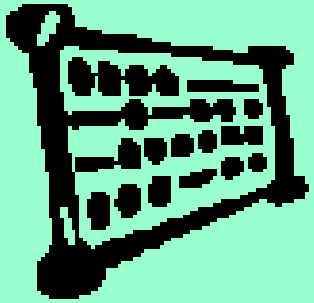
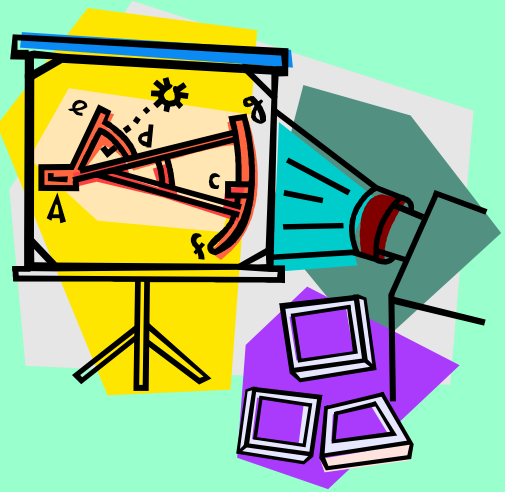
1. Sequences and the General Term





Sequences

A **sequence** is just a pattern of numbers connected by some rule.

This rule allows us to establish any term in the sequence.

You have already come across this when **"finding the rule for the nth term."**

Remember

n = 1, 2, 3, 4, 5, 6

4 , 9 , 14, 19, 24, 29……

+5 +5 +5 +5 +5

Rule for nth term = 5 x n -1

This is an **explicit formula** because it allows us to find term n without having to calculate all the other terms before term n in the sequence.

Explicit formula for terms in a sequence.

Example 1

Find the first 5 terms in the sequence defined by $U_n = n(n+3)$

Solution:

$$U_n = n(n+3)$$

Term **1** : $U_1 = 1 \times (1 + 3) = 4$

Term **2** : $U_2 = 2 \times (2 + 3) = 10$

Term **3** : $U_3 = 3 \times (3 + 3) = 18$

Term **4** : $U_4 = 4 \times (4 + 3) = 28$

Term **5** : $U_5 = 5 \times (5 + 3) = 40$

Example 2

Look at this list and think of an explicit formula for the nth term.

$$\frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6} \ldots\ldots\ldots$$

Always think "how do the given numbers relate to n?"

Solution:

n = 1, 2, 3, 4,

$$\frac{n+1}{n+2}, \frac{n+1}{n+2}, \frac{n+1}{n+2} \ldots\ldots\ldots$$

So:

$$U_n = \frac{n+1}{n+2}$$

Booklet , p.2, EX 1