

Section 5: Sequences and recurrence relations

Exercise

- Write down the first four terms of each sequence defined below, starting with $k = 1$ in each case.
 - $a_k = 3k - 1$
 - $a_k = 2 \times 3^k$
 - $a_k = k^2$
 - $a_k = (-1)^k 2^k$
 - $a_{k+1} = 2a_k + 1, a_1 = 2$
 - $a_{k+1} = 1 - a_k, a_1 = 3$
- Write down the first four terms of each sequence defined below, starting with $n = 5$ in each case.
 - $u_n = n - 5$
 - $u_n = \frac{1}{n^2}$
 - $u_n = (-1)^n \left(\frac{1}{2}\right)^n$
 - $u_n = u_{n-1} + u_{n-2}, u_1 = 1, u_2 = -2$
- The value of a car decreases by 10% every year of its life. If its original value is $a_0 = 14,000$ write down recursive definition for the sequence a_k where a_k is the value of the car after k years.
- The value of a rare toy train set increases by 2% each year. If the value of the train set is £150 now write down a formula in terms of k for a_k , the value of the train set in k years' time.

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