Contents

0.1 Series

0.1.1 Definition

A series is the summation of a sequence. For a series a_n there is a corresponding series:

$s_n = \sum_{i=0}^{n} a_n$

Where:

$\sum_{i=0}^{n} a_i = a_0 + a_1 + a_2 + ... + a_n$

0.1.2 Multiplication of summations

If all members of a sequence are multiplied by a constant, so is each member of the series.

We can take constants out of the series:

$s_n = \sum_{i=0}^{n} a_i$

$s_n = \sum_{i=0}^{n} cb_i$

$s_n = a \sum_{i=0}^{n} b_i$

0.1.3 Summation of constants

If all elements of a sequence are the same, then the series is a multiple of that constant.

$s_n = \sum_{i=0}^{n} a_i$

$s_n = \sum_{i=0}^{n} c$

$s_n = nc$

0.1.4 Addition of summations

Consider a sequence $a_i = b_i + c_i$.

$s_n = \sum_{i=0}^{n} a_i$

$s_n = \sum_{i=0}^{n} (b_i + c_i)$

We can then split this out.

$s_n = \sum_{i=0}^{n} b_i + \sum_{i=0}^{n} c_i$

0.1.5 Summation from a different start point

$\sum_{i=0}^{n} a_i = a_0 + \sum_{i=1}^{n} a_i$

0.1.6 Multiple summations

$\sum_{i=0}^{n} \sum_{j=0}^{m} a_i = n \sum_{j=0}^{m} a_i$

$\sum_{i=0}^{n} \sum_{j=0}^{m} a_i b_j = \sum_{i=0}^{n} a_i \sum_{j=0}^{m} b_i$