SEQUENCES

general case	arithmetic sequences	geometric sequences
u_n is the nth term n is the term number $\begin{bmatrix} the\ starting\ value \\ the\ initial\ term \\ the\ first\ term \end{bmatrix}$	Each term is obtained from the previous one by adding a constant. This constant is called <u>the common difference</u> and is denoted by "d".	Each term is obtained from the previous one by multiplying by a constant. This constant is called <u>the common ratio</u> and is denoted by "r".
$\begin{bmatrix} to\ display \\ to\ generate \end{bmatrix}$ a sequence, you can : * give $\begin{bmatrix} a\ formula \\ an\ expression \\ a\ rule \end{bmatrix}$ for $\begin{bmatrix} the\ general\ term \\ the\ nth\ term \end{bmatrix}$ * give a recurrence relation (In this case, a term of the sequence is determined in terms of some of the preceding terms.)	Formula ($n \geq 1$) $u_n = u_1 + (n-1)d$ Recurrence relation $u_{n+1} = u_n + d$	Formula ($n \geq 1$) $u_n = u_1 \times r^{(n-1)}$ Recurrence relation $u_{n+1} = u_n \times r$
<u>summing the first n terms of a sequence</u> sigma notation : $\sum_{k=1}^{n} u_k = u_1 + u_2 + \cdots + u_n$ That means: "Sum up u_k where k goes from 1 to n." or: "Sum up all the terms u_k where k takes the values from 1 to n"	The sum of the first n terms of an arithmetic sequence is: $S_n = \sum_{k=1}^{n} u_k = \frac{n \times (u_1 + u_n)}{2}$ <u>particular case :</u> $1 + 2 + \cdots + n = \frac{n \times (n+1)}{2}$	The sum of the first n terms of a geometric sequence with common ratio r (with $r \neq 1$) is: $S_n = \sum_{k=1}^{n} u_k = u_1 \times \frac{1 - r^n}{1 - r}$ <u>particular case :</u> $1 + r + r^2 + \cdots + r^n = \frac{1 - r^{n+1}}{1 - r}$