SEQUENCES

n^{th} term of an arithmetic sequence	In the arithmetic sequence with first term a_1 and common difference d, the n^{th} term, a_n, is given by	$a_n = a_1 + (n-1)d$
n^{th} term of a geometric sequence	In the geometric sequence with first term a_1 and common ratio, r, the n^{th} term is given by	$a_n = a_1 r^{n-1}$
sum of the first n terms of an arithmetic sequence	If an arithmetic sequence has first term a_1 and common difference d, then the sum of the first n terms is given by	$S_n = \frac{n}{2}(a_1 + a_n)$ or $S_n = \frac{n}{2}\left[2a_1 + (n-1)d\right]$
sum of the first n terms of a geometric sequence	If a geometric sequence has first term a_1 and common ratio r, then the sum of the first n terms is given by	$S_n = \frac{a_1(1-r^n)}{1-r}$, where $r \neq 1$
sum of the terms of an infinite geometric sequence	The sum of an infinite geometric sequence with first term a_1 and common ratio r, where $-1 < r < 1$, is given by	$S = \frac{a_1}{1-r}$
n-factorial (n!)	For any nonnegative integer n	$n! = n(n-1)(n-2)\cdots(3)(2)(1)$ and $0! = 1$
binomial coefficient	For nonnegative integers n and r, with $r \le n$, the symbol $\binom{n}{r}$ is defined as	$\binom{n}{r} = \frac{n!}{r!(n-r)!}$
the r^{th} term of the binomial expansion	The r^{th} term of the binomial expansion of $(x+y)^n$, where $n \ge r-1$ is	$\binom{n}{n-(r-1)} x^{n-(r-1)} y^{r-1}$
binomial theorem	For any positive integer n: $(x+y)^n = x^n + \binom{n}{n-1}x^{n-1}y + \binom{n}{n-2}x^{n-2}y^2 + \cdots + \binom{n}{1}xy^{n-1} + y^n$	