序列、无穷级数、求和

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序列 sequence

定义：

- A *sequence* is a function from a subset of the set of integers (typically the set $\{0, 1, 2, \ldots\}$ or $\{1, 2, 3, \ldots\}$ to a set S. We use the notation a_n to denote the image of the integer n. ($\{a_n\}$ represents the ordered list $a_1, a_2, a_3, \ldots$)

有限和 summation

无穷级数 infinite series　　可以通过求导或者积分来解

等差数列 arithmetic progression

等比数列 geometric progression

TABLE 2 Some Useful Summation Formulae.

Sum	*Closed Form*
$\sum_{k=0}^{n} ar^k \ (r \neq 0)$	$\frac{ar^{n+1} - a}{r - 1}, r \neq 1$
$\sum_{k=1}^{n} k$	$\frac{n(n+1)}{2}$
$\sum_{k=1}^{n} k^2$	$\frac{n(n+1)(2n+1)}{6}$
$\sum_{k=1}^{n} k^3$	$\frac{n^2(n+1)^2}{4}$
$\sum_{k=0}^{\infty} x^k, \lvert x \rvert < 1$	$\frac{1}{1-x}$
$\sum_{k=1}^{\infty} kx^{k-1}, \lvert x \rvert < 1$	$\frac{1}{(1-x)^2}$