

# Sequences

## Arithmetic

- Recurrence form:  $a_n = a_{n-1} + c$

$$a_n = a_1 + (n - 1)d$$

derived from

$$S_n = \frac{n(a_1 + a_n)}{2}$$

formula for the sum of an arithmetic series

## Geometric

- Recurrence form:  $a_n = r \cdot a_{n-1}$  for  $n \geq 2$

- Explicit form:  $a_n = a_1 r^{n-1}$

Derived

$$S_n = \frac{a_1(1 - r^n)}{1 - r} \text{ for } r \neq 1$$

formula for the sum of a geometric series

## Infinite

$$S = \frac{a_1}{1 - r}$$

sum of an infinite geometric series

## Series