

Discrete Mathematics

Induction and Recursion

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Recursive Definitions

Recursive Sequence

Some sequences are constructed by using a formula and a few beginning terms.

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Terminology.

- The beginning terms are called initial condition, initial terms, or **basis**.
- The formula used to construct further terms is called a **recursive rule**. There may be more than one recursive rule.

Creating Recursive Relations

Recursive sequences can be used to manipulate data generated by repeated operations.

Example. Find a recursive definition for

$$g(n) = 1^2 + 2^2 + \cdots + n^2.$$

Exercise

How about $f(n) = \frac{1}{1 \cdot 2} + \frac{1}{2 \cdot 3} + \dots + \frac{1}{n(n+1)}$?