

Key Terms and Results

TERMS

Sequence 数列: a function with domain that is a subset of the set of integers

geometric progression 几何级数: a sequence of the form a, ar, ar^2, \dots , where a and r are real numbers

arithmetic progression 算术级数: a sequence of the form $a, a + d, a + 2d, \dots$, where a and d are real numbers

the principle of mathematical induction 数学归纳法: the statement $\forall n P(n)$ is true if $P(1)$ is true and $\forall k [P(k) \rightarrow P(k + 1)]$ is true.

basis step 基本步: the proof of $P(1)$ in a proof by mathematical induction of $\forall n P(n)$

inductive step 归纳步: the proof of $P(k) \rightarrow P(k + 1)$ for all positive integers k in a proof by mathematical induction of $\forall n P(n)$

strong induction 强归纳: the statement $\forall n P(n)$ is true if $P(1)$ is true and $\forall k [(P(1) \wedge \dots \wedge P(k)) \rightarrow P(k + 1)]$ is true

well-ordering property 良序性: Every nonempty set of nonnegative integers has a least element.

recursive definition of a function 函数的递归定义: a definition of a function that specifies an initial set of values and a rule for obtaining values of this function at integers from its values at smaller integers

recursive definition of a set 集合的递归定义: a definition of a set that specifies an initial set of elements in the set and a rule for obtaining other elements from those in the set

structural induction 结构归纳: a technique for proving results about recursively defined sets

recursive algorithm 递归算法: an algorithm that proceeds by reducing a problem to the same problem with smaller input

merge sort 合并排序: a sorting algorithm that sorts a list by splitting it in two, sorting each of the two resulting lists, and merging the results into a sorted list

iteration 迭代: a procedure based on the repeated use of operations in a loop

program correctness 程序正确性: verification that a procedure always produces the correct result

loop invariant 循环不变: a property that remains true during every traversal of a loop

initial assertion 初始断言: the statement specifying the properties of the input values of a program

final assertion 最终断言: the statement specifying the properties the output values should have if the program worked correctly