Course Number

Instructor

Date

Section 9.4 Mathematical Induction

Objective: In this lesson you learned how to use mathematical induction to prove a statement involving a positive integer n.

Important Vocabulary Define each term or concept.

Mathematical induction

First differences

Second differences

I. Introduction (Pages 718–721)

What you should learn
How to use mathematical induction to prove a statement

To apply the Principle of Mathematical Induction, you need to be able to determine the statement _____ for a given statement P_k.

When using mathematical induction to prove a summation formula, it is helpful to think of S_{k+1} as . . .

Describe the process needed to prove a formula using mathematical induction.

The extended principle of mathematical induction is . . .

II. Sums of Powers of Integers (Pages 722–723)

What you should learn
How to find the sums of powers of integers

List the formulas for the following sums of powers of integers.

1. $1+2+3+4+\cdots+n=$ _____

2. $1^2+2^2+3^2+4^2+\cdots+n^2=$ _____

3. $1^3+2^3+3^3+4^3+\cdots+n^3=$ _____

4. $1^4+2^4+3^4+4^4+\cdots+n^4=$ _____

5. $1^5+2^5+3^5+4^5+\cdots+n^5=$ _____

III. Pattern Recognition (Pages 723–724)

What you should learn
How to recognize patterns and write the *n*th term of a sequence

To find a formula for the *n*th term of a sequence, . . .

IV. Finite Differences (Page 725)

What you should learn
How to find finite differences of a sequence

When the first differences of a sequence are all the same, the sequence has a _____ model.

When the second differences of a sequence are all the same, the sequence has a _____ model.

Homework Assignment

Page(s)

Exercises