

Section 8.4 Mathematical Induction

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

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Mathematical induction**First differences****Second differences****I. Introduction** (Pages 608–611)

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

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

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 612–613)

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

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

III. Pattern Recognition (Pages 613–614)

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

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

IV. Finite Differences (Page 615)

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.

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

Homework Assignment

Page(s)

Exercises