

Chapter 10 Sequences, Series, and Probability

Course Number

Instructor

Date

Section 10.1 Sequences and Series

Objective: In this lesson you learned how to use sequence, factorial, and summation notation to write the terms and sums of sequences.

Important Vocabulary

Define each term or concept.

Recursive

I. Sequences (Pages 696–698)

An **infinite sequence** is . . .

What you should learn

How to use sequence notation to write the terms of a sequence

The function values $a_1, a_2, a_3, a_4, \dots, a_n, \dots$ are the _____ of an infinite sequence.

A **finite sequence** is . . .

To find the first three terms of a sequence, given an expression for its n th term, . . .

Example 1: Find the first five terms of the sequence given by

$$a_n = 5 + 2n(-1)^n.$$

II. Factorial Notation (Pages 698–699)

If n is a positive integer, **n factorial** is defined by

What you should learn

How to use factorial notation

By definition, zero factorial is _____.

Example 2: Evaluate the factorial expression $\frac{n!}{(n+1)!}$.

III. Summation Notation (Pages 700–701)

The sum of the first n terms of a sequence is represented by the **summation or sigma notation**,

$$\sum_{i=1}^n a_i = \underline{\hspace{4cm}}$$

where i is called the _____, n is the _____, and 1 is the _____.

What you should learn
How to use summation notation to write sums

Example 3: Find the following sum: $\sum_{i=2}^7 (2 + 3i)$.

IV. Series (Page 701)

The sum of the terms of a finite or infinite sequence is called a _____.

What you should learn
How to find the sum of an infinite series

Consider the infinite sequence $a_1, a_2, a_3, \dots, a_i, \dots$. The sum of all terms of the infinite sequence is called a(n) _____

and is denoted by $a_1 + a_2 + a_3 + \dots + a_i + \dots = \sum_{i=1}^{\infty} a_i$. The sum of

the first n terms of the sequence is called a(n) _____ or the _____ of the sequence and is denoted by

$$a_1 + a_2 + a_3 + \dots + a_n = \sum_{i=1}^n a_i.$$

Homework Assignment

Page(s)

Exercises