

Chapter 8 Sequences, Series, and Probability

Course Number

Instructor

Date

Section 8.1 Sequences and Series

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

Important Vocabulary

Define each term or concept.

Terms of a sequence

Recursive

I. Sequences (Pages 578–580)

An **infinite sequence** is . . .

What you should learn

How to use sequence notation to write the terms of a 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 580–581)

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 582–583)

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 583)

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