Section 9.3 Geometric Sequences and Series

Objective: In this lesson you learned how to recognize, write, and manipulate geometric sequences.

Important Vocabulary

Define each term or concept.

Geometric sequence

Common ratio

Infinite geometric series or geometric series

I. Geometric Sequences (Pages 625–627)

The *n*th term of a geometric sequence has the form

_____, where *r* is the common ratio of

consecutive terms of the sequence. So, every geometric sequence can be written in the following form:

A geometric sequence may be thought of as a(n)

_____ function whose domain is the set of

natural numbers.

Example : Determine whether or not the following sequence is geometric. If it is, find the common ratio. $60, 30, 0, -30, -60, \ldots$

To find the (n + 1)th term of a geometric sequence given the *n*th term of the same sequence, . . .

Example : Write the first five terms of the geometric sequence whose first term is $a_1 = 5$ and whose common ratio is -3.

Example : Find the eighth term of the geometric sequence that begins with 15 and 12.

What you should learn How to recognize and write geometric sequences

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II. The Sum of a Finite Geometric Sequence (Page 628)

The sum of the geometric sequence $a_1, a_1r, a_1r^2, a_1r^3, a_1r^4, \ldots$, a_1r^{n-1} with common ratio $r \neq 1$ is given by

When using the formula for the sum of a geometric sequence, be careful to check that the index begins with i = 1. If the index begins at i = 0, ...

Example: Find the sum
$$\sum_{i=1}^{10} 2(0.5)^i$$
.

III. Geometric Series (Page 629)

If |r| < 1, the sum of the infinite geometric series a_1, a_1r, a_1r^2 , $a_1r^3, a_1r^4, \ldots, a_1r^{n-1}, \ldots$ is ______.

Example: If possible, find the sum: $\sum_{i=1}^{\infty} 9(0.25)^{i-1}$.

IV. Application (Page 630)

Describe a real-life problem that could be solved by finding the sum of a finite geometric sequence.

What you should learn How to use geometric sequences to model and solve real-life problems

Homework Assignment

Page(s)

Exercises

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

What you should learn How to find the sum of a geometric sequence