U6 Chapter 3

Sequences and Series

Chapter Overview

1. Sequences

2. Arithmetic Series

3. Geometric Series

4. Sigma Notation

5. Recurrence Relations

6. Combined Sequences

7. Classifying Sequences



Sequences

A sequence is an ordered set of mathematical objects. Each element in the sequence is called a term.

Arithmetic Sequences

Examples

1. The th term of an arithmetic sequence is .

1. Write down the first 3 terms of the sequence.
2. Find the first term in the sequence that is negative.

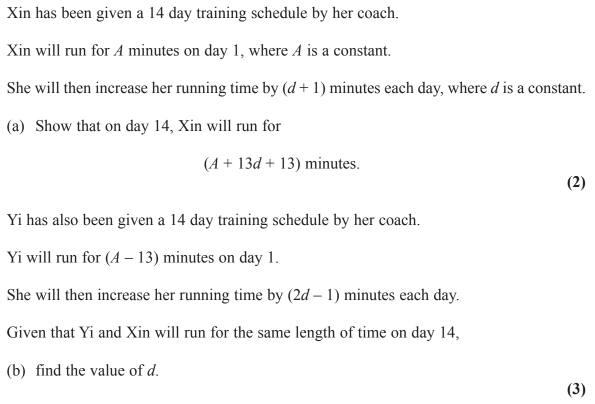
2. Find the th term of each arithmetic sequence.

1. 6, 20, 34, 48, 62
2. 101, 94, 87, 80, 73

3. A sequence is generated by the formula where and are constants to be found. Given that and , find the values of the constants and .

4. For which values of would the expression and form the first three terms of an arithmetic sequence.

Test Your Understanding



Extension

[STEP I 2004 Q5] The positive integers can be split into five distinct arithmetic progressions, as shown:

A: 1, 6, 11, 16, …

B: 2, 7, 12, 17, …

C: 3, 8, 13, 18, …

D: 4, 9, 14, 19, …

E: 5, 10, 15, 20, …

Write down an expression for the value of the general term in each of the five progressions. Hence prove that the sum of any term in B and any term in C is a term in E.

Prove also that the square of every term in B is a term in D. State and prove a similar claim about the square of every term in C.

1. Prove that there are no positive integers and such that
2. Prove also that there are no positive integers and such

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