

Introduction

This diagnostic assessment is designed to evaluate students' understanding of arithmetic progressions, their ability to identify and calculate terms, and apply arithmetic progressions to solve problems.

Section 1: Multiple Choice

Choose the correct answer for each question:

1. What is the common difference in the arithmetic progression 2, 5, 8, 11, ...?
 1. A) 2
 2. B) 3
 3. C) 4
 4. D) 5
2. Which of the following sequences is an arithmetic progression?
 1. A) 1, 2, 4, 8, ...
 2. B) 2, 4, 6, 8, ...
 3. C) 3, 6, 9, 12, ...
 4. D) 4, 7, 10, 13, ...
3. If the first term of an arithmetic progression is 5 and the common difference is 2, what is the 10th term?
 1. A) 21
 2. B) 23
 3. C) 25
 4. D) 27

Section 2: Short Answer

Answer each question in the space provided:

1. Find the sum of the first 10 terms of the arithmetic progression 3, 6, 9, 12, ...

2. A sequence of numbers has a common difference of 4. If the first term is 2, find the 5th term.

Section 3: Project-Based

Complete the task below:

Task: Bookshelf Problem

A bookshelf has 5 shelves, and the number of books on each shelf forms an arithmetic progression. If the first shelf has 10 books and the common difference is 3, how many books are on the 5th shelf? Create a diagram to illustrate your solution and explain your reasoning.

[Space for diagram and explanation]

Activity 1: Identifying Arithmetic Progressions

Identify whether each of the following sequences is an arithmetic progression:

1. 2, 4, 6, 8, ...

2. 1, 3, 5, 7, ...

3. 3, 6, 9, 12, ...

Activity 2: Finding the Common Difference

Find the common difference in each of the following arithmetic progressions:

1. 5, 8, 11, 14, ...

2. 2, 5, 8, 11, ...

3. 1, 4, 7, 10, ...

Activity 3: Real-World Applications

Provide examples of real-world situations where arithmetic progressions are used:

1. Finance: _____

2. Science: _____

3. Technology: _____

Conclusion

This diagnostic assessment is designed to evaluate students' understanding of arithmetic progressions and their ability to apply them to solve problems.

Answer Key

Check your answers with the answer key below:

Multiple Choice

1. B) 3
2. B) 2, 4, 6, ...
3. B) 23

Short Answer

1. The sum of the first 10 terms is 330.
2. The 5th term is 14.

Project-Based

The number of books on the 5th shelf is 28.

