

Algebra I

Notes 1.2 Using Differences to Identify Patterns

Objectives:

- Find the pattern of a sequence using the difference method.
- Extend a sequence by working backward from the differences.

Some sequences have a pattern that can be identified by subtracting consecutive terms. Repeating the subtraction of differences may result in a **constant difference** which can be used to work backward to find more terms of a sequence.

Use the **difference method** to find the next three terms.

0, 57, 108, 153, 192, _____, _____, _____, ...

10, 29, 66, 127, 218, _____, _____, _____, ...

A number pattern starts with 7. The first differences start with 4. The second differences are constant at 3. Write the first five numbers in the pattern.

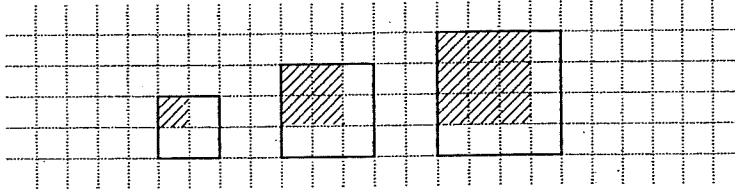
A number pattern starts with 2. The first differences start with 2. The second differences are constant at 2. Write the first five numbers in the pattern.



Practice & Apply

1.2 Using Differences to Identify Patterns

1. If the shaded region is removed from each figure shown, how many squares remain? _____, _____, _____,



2. Guess the number of squares remaining for a figure of 25 squares and a figure of 36 squares. _____, _____, ...

Find the next two terms of each sequence.

3. 32, 29, 26, 23, 20, _____, _____

4. 500, 517, 532, 545, 556, _____, _____

5. 13, 52, 82, 103, 115, _____, _____

6. 89, 74, 59, 44, _____, _____

Find the first and second differences of each sequence.

7. 5, 12, 20, 29, 39, ...

8. 6, 9, 14, 21, 30, ...

9. 20, 29, 41, 56, 74, ...

10. 17, 19, 22, 26, 31, ...