


Section 1-2

An Application of Inductive Reasoning: Number Patterns




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Number Sequences

Number Sequence
A list of _____ having a first number, a second _____, and so on, called the _____ of the sequence.

_____ **Sequence**
A sequence that has a common difference between successive terms.

_____ **Sequence**
A sequence that has a common ratio between successive terms.



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Example: Successive Differences

Use the method of successive differences to find the next number in the sequence.

14 22 32 44

 8 10 12

 2 2




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Number Patterns and Sum Formulas

Sum of the First n Odd Counting Numbers
If n is any counting number, then
$$1 + 3 + 5 + \dots + (2n - 1) = n^2.$$

Counting number sum formula:
and
$$1 + 2 + 3 + \dots + n = \frac{n(n+1)}{2}.$$



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Example:
Add the following numbers.

$1 + 3 + 5 + \dots + 101$

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Example:
Add the following numbers.

$1 + 3 + 5 + \dots + 49$

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Example:

Add the following numbers.

$$1 + 2 + 3 + \dots 49$$

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Example:

Add the following numbers.

$$1 + 2 + 3 + \dots 900$$

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