

Iterative or recursive patterns :

You can use patterns to investigate relationships between numbers and to solve problems. Once you find the rule for a pattern, you can describe, extend, or analyze it. You can also use the rule as the basis for creating new patterns

Iterative pattern

An iterative pattern relates the terms by calculating the same operation(s) repetitively from one term to the next.

Recursive pattern

A recursive pattern relates the next term in the pattern to the previous term.

EXAMPLE # 1

Find the rules for the following patterns

$$\diamond 1, 4, 7, 10, 13, 17, \dots \quad \text{SOLUTION} \rightarrow N + 3$$

EXAMPLE # 2

Write the next three terms of the pattern. Then, write the rule for the pattern.

$$\triangleright 1, 7, 13, 19, 25, \dots \quad \text{SOLUTION} \rightarrow 31, 37, 43, \quad N + 6$$

Find the "nth" term :

Sequences

A sequence has terms that are arranged in a certain order. Sequences are either finite or infinite. In a finite sequence, you can count the number of terms in the sequence. In an infinite sequence, you can't count the number of terms. The sequence goes on forever.

The n th term

Notation such as $a_1, a_2, a_3, \dots, a_n$ is used to represent the terms of a sequence. The subscripts identify the position of the terms in the sequence. The n th term of a

sequence is denoted by a_n where n represents the position of the term in the sequence. The n th term can be any term.

Arithmetic sequences

An arithmetic sequence is a sequence of numbers where the difference between consecutive terms is constant. This is called the common difference (d).

Geometric sequences

A geometric sequence is a sequence of numbers where the ratio of consecutive terms is constant. This ratio is called the common ratio (r). Sometimes the terms of a geometric sequence get so large that you may need to express the terms in scientific notation rounded to the nearest tenth.

EXAMPLE

Find the term designated in each of the following sequences.

□ 1, 4, 9, 16, 25,... Find the 8th term SOLUTION → 66