Recursive and Explicit definitions :

Recursive definition

A recursive definition describes a sequence whose terms are defined by one or more preceding terms. Known terms are used to calculate new terms. New terms become known terms and are used to calculate even more new terms.

For Addition:
Use the following formula to find any term of an arithmetic sequence.

$$a_n = (a_{n-1}) + d$$

For Multiplication:
Use the following formula to find any term of a geometric sequence.

$$a_n = (a_{n-1}) \bullet r$$

Explicit Definition

The explicit definition allows you to calculate any term in a sequence by using the first term and the common difference (ratio) between terms. The explicit definition can also be used to solve real-world problems.

For Addition:
Use the following formula to find any term of an arithmetic sequence.

$$a_n = a_1 + (n-1)d$$

For Multiplication:
Use the following formula to find any term of a geometric sequence. The explicit definition can also be used to solve real-world problems.

$$a_n = a_1 r^{n-1}$$

Relations and Functions :

Relation

A relation is a set of any ordered pairs (x, y).

Functions
A function is a special kind of relation. Each ordered pair that makes up a function had a different x-coordinate.

Domain
The domain of a function is the independent variable or input. It is also considered the x-coordinate of the ordered pair.

Range
The range of a function is the dependent variable or output. It is also considered the y-coordinate of the ordered pair.

Functions can be represented in a graph, a table or a set of ordered pairs. You will have to be able to identify if a set of data is a function or not.

- Graphs
  A graph is a function if it passes the vertical line test. A relation is a function if you can draw an imaginary vertical line anywhere on the graph and it crosses the graph in only one place.

- Table
  A table is a function if you can turn the points into ordered pairs and then determine if all the x-coordinates are unique (does not repeat).

- Ordered pairs
  To see if ordered pairs are functions, check to see if the x-coordinate repeats itself.