Lesson 1

The topic for this lesson is on **sets**.

Roughly speaking, a set is a collection of objects. The objects can be anything: numbers, functions, other sets, a combination of these, or nothing at all.

All that matters is what objects are in the set, order is unimportant.

There might be a finite number of objects in the set, that makes a finite set. Otherwise, it is an infinite set. The objects in the set are called the elements or members of the set.

There are two basic ways that one can describe a set. The first is to list its elements such as

$$A = \{2, 9, 22\}$$

This is a set with three elements and the simplest way to define or describe a set: By listing the elements inside of curly braces and separate the elements by commas.

As we said earlier, order doesn't matter so $A = \{9, 22, 2\} = \{2, 9, 22\}$.

Also each element can only be in the set once, so $B = \{3, 6, 3\}$ is not legal as a set.

Sometimes it's impractical to list a big set, so we can use ellipses if the pattern is clear. For example we can describe $\{1, 2, 3, \ldots, 99, 100\}$ reasonably.

If a set is infinite, then we can list the elements using ellipses, such as $\{1, 2, 3, \ldots\}$. Just make sure the pattern is clear.