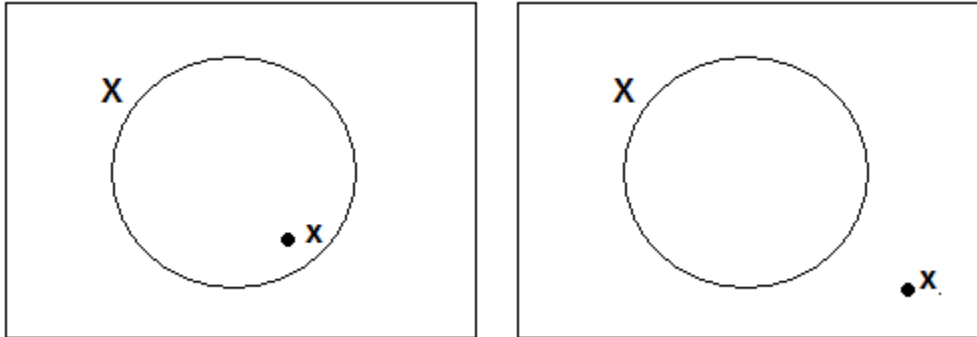


## 2.1 Basic Set Theory

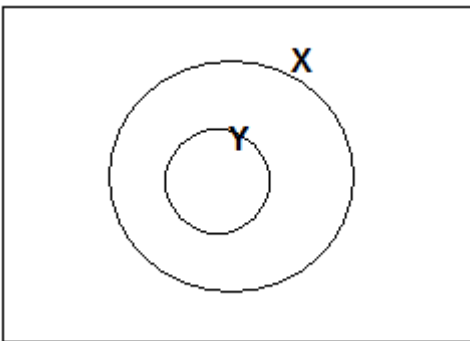
A **set** is a collection of elements where you can always tell whether an element is in the set or not.



In the pictures above  $X$  is the set and  $x$  is an element. In the picture on the right it is clear that  $x$  is not in the set  $X$ . In the picture on the left,  $x$  is inside the circle so it is clearly in the set.

When an element is in a set it can be written as  $x \in X$ .

A set is a **subset** of another if all of its elements are also in that other set.



In the picture above, all of the elements that are in set  $Y$  are also in set  $X$ . This makes  $Y$  a subset of  $X$ . This can be written as  $Y \subseteq X$ .