

A set that has no elements is called the empty set or null set. We use the symbol \emptyset or brackets with nothing in them $\{ \}$ to indicate that.

An example of an empty set would be all the states that begin with the letter z.

The universal set is the set that contains all the elements being considered in a discussion. The universal set is denoted by **U**. It's important that you recognize the universal set in any given problem.

Let's say we are discussing the letters a, b, and c. The universal set could be all the letters in the alphabet So

$$U = \{x / \text{is a letter in the alphabet}\}$$

Now, if the only letters I am actually discussing are a, b, and c, then I could describe those letters in set notation.

$$T = \{a, b, c\}$$

What happens if I want to discuss the letters that are not elements of T? Well, you know that would be the letters d through z. When you want to talk about members or elements

not in a particular set, we call that the complement of the set. There are a number of ways to show this symbolically; $\sim T$, T' , or \bar{T} .

I'm going to use the $\sim T$ notation. Now back to set T , $\{a,b,c\}$. If we want to talk about the letters not in T , we write

$$\sim T = \{x / x \in U \text{ and } x \notin T\}$$

So the **complement** is made up of all the members in the universal set that are not members of T .