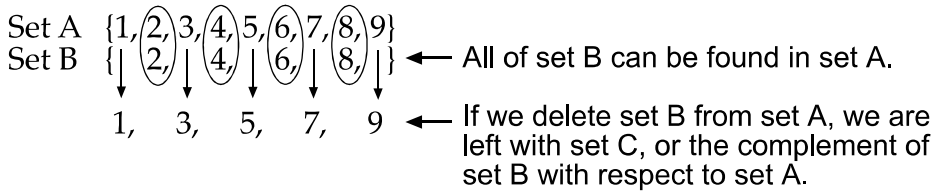
Complements

Look at set A {1, 2, 3, 4, 5, 6, 7, 8, 9} and set B {2, 4, 6, 8}. Do you see that all of the elements from set B can be found in set A? If we delete set B from set A we are left with the elements 1, 3, 5, 7, 9.



We could place these in a set and call it by another name, perhaps set C. We call set C the **complement** of set B with respect to set A. In other words, when we delete the elements of set B from set A we end up with set C.

Let's look at another example.

With respect to set R {red, orange, yellow, green, blue, indigo, violet}, find the *complement* of set S {red, yellow, blue}. We would delete red, yellow, and blue from set R and end up with a new set T {orange, green, indigo, violet}.

In symbols, this example looks like the following.

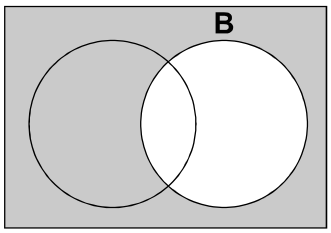
$$R - S = T.$$

The symbol for complement looks like a minus sign (–).

Complements in Venn Diagrams

When talking about complements in Venn diagrams, we use a slightly different notation.

The figure below represents the complement of B.



We use the symbol $\overline{B}$ to indicate that we are deleting all the elements of set B from the diagram and shading everything except what is in set B.