DISCRETE STRUCTURE AND THEORY OF LOGIC

KCS-303

SET THEORY

PART-II

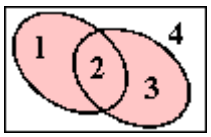
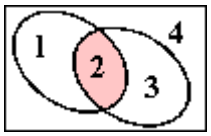
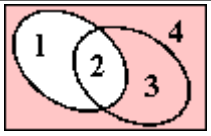
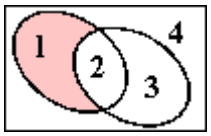
Empty (or Null) Set—

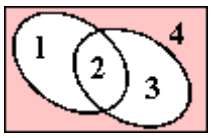
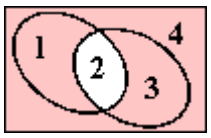
This is probably the weirdest thing about sets.
As an example, think of the set of piano keys on a guitar.

"But wait!" you say, "There are no piano keys on a guitar!"

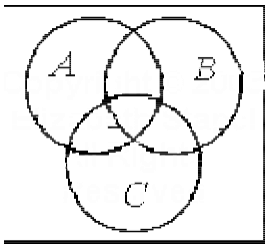
And right you are. It is a set with **no elements**.

This is known as the **Empty Set** (or Null Set).There aren't any elements in it. It ∅ is represented by ø
Or by **{}** (a set with no elements)
Some other examples of the empty set are **the set of countries south of the South Pole**. So what's so weird about the empty set? Well, that part comes next.

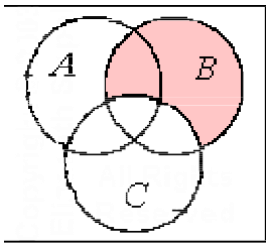
set notation	pronunciation	Meaning	Venn diagram	answer
$A \cup B$	"A union B"	everything that is in either of the sets		{1, 2, 3}
$A \wedge B$ or $A \cap B$	"A intersect B"	only the things that are in both of the sets		{2}
A^c or $\sim A$	"A complement", or "not A"	everything in the universe outside of A		{3, 4}
				
$A - B$	"A minus B", or "A complement B"	everything in A except for anything in its overlap with B		{1}

~(*A* U *B*)	"not (*A* union *B*)"	everything outside *A* and *B*		{4}
~(*A* ^ *B*) or ~( )	"not (*A* intersect *B*)"	everything outside of the overlap of *A* and *B*		{1, 3, 4}

- **Given the following Venn diagram, shade in *A* U(*B* – *C*).**



we will first find *B* – *C*. "*B* complement C" means I take *B* and then throw out its overlap with *C*, which gives me this:



Now we have to union this with *A*: