

(13)

If we require  
that these 3 operations  
 $\subset$ ,  $\cup$ ,  $\cap$  always  
produce sets,

Then

$$A \cap A^c \equiv \{x \in U; x \in A \text{ and } x \notin A\}$$

must be a set in  $U$ !

It is called the empty  
set  $\phi$ . The set with no  
elements.