

# Section 1.7: The Algebra of Sets

Wednesday, October 07, 2015  
11:05 AM

membership table:

consider the element  $x$  in the universe  $U$

the set  $A$  is a subset of  $U$

two possibilities:  $x \in A$   
 $x \notin A$

example: draw the membership table for  $A \cap \bar{A}$

long-winded version (do not use!)

$x \in A$	$x \in \bar{A}$	$x \in (A \cap \bar{A})$
no	yes	no
yes	no	no

terse version:

$A$	$\bar{A}$	$A \cap \bar{A}$
0	1	0
1	0	0

example: write out the membership table for  $\bar{A} \cup B$

$A$	$B$	$\bar{A}$	$\bar{A} \cup B$
0	0	1	1
0	1	1	1
1	0	0	0

0	0	0

example: Are the sets  $\bar{B} \cup (B \cap \bar{A})$  and  $\bar{A} \cup \bar{B}$  equal to each other?

A	B	$\bar{A}$	$\bar{B}$	$B \cap \bar{A}$	$\bar{B} \cup (B \cap \bar{A})$	$\bar{A} \cup \bar{B}$
0	0	1	1	0	1 1 1 0	1 1 1 0
0	1	1	0	1		
1	0	0	1	0		
1	1	0	0	0		

YES