Chapter 7

Logic and Proofs

We do Proofs at the End

Logic

7.1 Using and, or, and Not

And - compound event

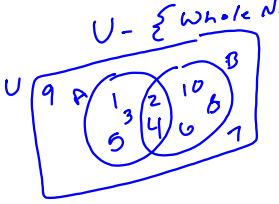
Or - Exclusive events

Not - Opposite
Complimentary

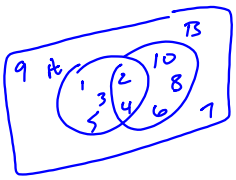
A {1, 2, 3, 4, 5}

B {2, 4, 6, 8, 10}

U - {Whole Numbers 1 - 10}



and - conjunction
symbolically
$A \cap B$
In Both = 2, 4

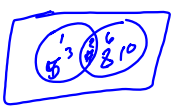


Or - Disjunction
symbolically
$A \cup B$
Either
{1, 2, 3, 4, 5, 6, 8, 10}

Exclusive Or ($\oplus$)

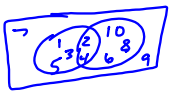
Say take out stuff they share

Either A or B but not both



{1, 3, 5, 6, 8, 10}

Not (Negation)



Not $(A \cap B)$
Symbolically
$\sim$ 7

{7, 9}

Not A {6, 7, 8, 9, 10}

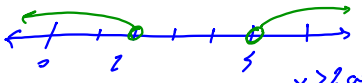
If there are no elements that satisfy the set, there is still a set

Empty Set

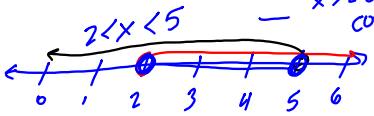
$\{\emptyset\}$

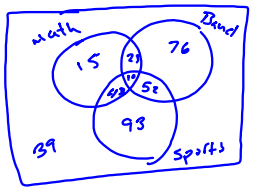
or, and, not in graphs

$x > 5$ or $x < 2$ disjunction



$2 < x < 5$ — $x > 2$ and $x < 5$ conjunction





If 350 people 39 not in something

Math 90

$15 + 76 + 93$

$43 + 23 + 52$

10

311