

MATH 2001  
STATEMENTS AND NEGATION

**Exercise 1.** Prove that  $\overline{A \cup B} = \overline{A} \cap \overline{B}$ .

**Exercise 2.** Prove that  $\overline{A \cap B} = \overline{A} \cup \overline{B}$ . (This is proof 7 in the proof portfolio.)

**Exercise 3.** Let  $A_y = [-1 - y, 1 + y]$ . Prove that  $\bigcap_{\substack{y \geq 0, \\ y \in \mathbb{R}}} A_y = [-1, 1]$ .

**Exercise 4.** Let  $A_y = (-y, y) \subseteq \mathbb{R}$  ( $A_y$  is an open interval). What is  $\bigcap_{y > 0} A_y$ ? Prove your claim.

**Upcoming deadlines:**

- Due Friday, Mar 4: final draft of proof 4, first draft of proof 7.
- Due Monday Mar 7: final draft of proof 5, final draft of proof 6.

As the number of proofs are piling up, from proof 6 onwards, I will only be giving one round of comments before final copies are due.