

## A warmup

Sketch Venn diagrams to illustrate each of the following conclusions, some of which we proved in class. All sets are assumed to be subsets of some appropriate universal set.

1. If  $A \subseteq B$ , then  $A - B = \emptyset$ .
2. If  $A \subseteq C$  and  $B \subseteq C$ , then  $A \cup B \subseteq C$ .
3. If  $X - B \subseteq X - A$ , then  $A \subseteq B$ .

**A parenthetical Q** (pun intended!): Notice that there are no parentheses around any of the set operations in the above exercises. Why? Think about how many different ways you could interpret each expression without parentheses.

**A related exercise:** The czar of Intro to Proofs has mandated that you must use parentheses (in a valid way!) in each of the above exercises. Figure out the right way to do it.

**One more exercise:** Sketch Venn diagrams to illustrate the relationship:  $A \cup (B \cap C) \subseteq (A \cup B) \cap (A \cup C)$ .

**Q:** Do we really need parentheses here?

Is  $A \cup (B \cap C) = (A \cup B) \cap C = A \cup B \cap C$ ?