

MATH 321: 9-3 GROUPWORK

- (1) Consider the two identities $(A \cup B) \setminus C = (A \setminus C) \cup (B \setminus C)$ and $A \cup (B \setminus C) = (A \cup B) \setminus (C \setminus A)$. Verify these two identities. For one, verify using Venn diagrams. For the other, verify by writing out in logical symbols what it means for an object x to be an element of each set and then use logical equivalences.
- (2) Verify that for any sets A and B you get that $(A \cup B) \setminus B \subseteq A$, using whatever method you like. Give an example of sets A and B for which $(A \cup B) \setminus B \neq A$.
- (3) The symmetric difference operation on sets is defined as $A \triangle B = (A \setminus B) \cup (B \setminus A)$. Give a definition of the symmetric difference in ordinary English and draw a Venn diagram for A and B that illustrates $A \triangle B$. Use Venn diagrams to verify that $(A \triangle B) \triangle C = A \triangle (B \triangle C)$.