

Proofs Involving Sets #6 (Miscellaneous Exercises)

FALL 2005

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Name _____

Instructions. Prove the following:

1. $U^c = \emptyset$
2. $\emptyset^c = U$
3. $(A^c)^c = A$
4. $(A \cup B) \cup C = A \cup (B \cup C)$
5. $(A \cap B) \cap C = A \cap (B \cap C)$
6. $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
7. $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
8. In an earlier section, we were asked to prove that $n(n+1)$ is divisible by 2, using induction. Prove this directly, without using induction.
9. In an earlier section, we were asked to prove that $n(n+1)(n+2)$ is divisible by 6, using induction. Prove this directly, without using induction.
10. In an earlier section, we were asked to prove that $n(n+1)(2n+1)$ is divisible by 6, using induction. Prove this directly, without using induction.