Math 300A&B **Introduction to Mathematical Reasoning** **Fall 2009**

Assignment #3: Due Wednesday, 10/21/09

Part II:

1. Prove each of the following theorems from the handout *The Real Numbers and the Integers*. Each proof should be a two-column proof like the ones we've been doing in class. As far as possible, try to limit each step to one single justification. Be careful to avoid the "high-school algebra fallacy"—creating a circular argument by assuming the thing you're trying to prove.

   For the theorems that include two conclusions (such as 3(d) and 4(a)), prove the first one only—for example, in 3(d), you only need to prove that $(-a)b = -(ab)$.

   - Theorem 3(b).
   - Theorem 3(c).
   - Theorem 3(d) (first equation only).
   - Theorem 4(a) (first equation only).
   - Theorem 4(d).
   - Theorem 5(b).