Math260 - Introduction to Mathematical Logic

Fall 2007 – Winter 2008

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Homework #7. Due Thursday, February 14, 2008.

1. Prove that TOT is neither r.e. nor co-r.e. [Hint: Prove that the halting problem is many-one reducible to TOT and that the complement of the halting problem is many-one reducible to TOT. Why is this enough?]

2. Prove that $I\Delta_0$ proves the distributive law. (You may assume the commutativity of multiplication, and the commutativity and associativity of addition.)

3. Prove that $I\Delta_0$ proves that multiplication is associative. (You may assume the same things as for the previous problems.)

4. Prove that Q proves $\forall y(y \leq 0 \rightarrow y = 0)$.

5. Prove that Q does not prove that addition is commutative.