

York University
CSE 2001 – Unit 5.1 Undecidability
Instructor: Jeff Edmonds

Read Jeff's notes. Read the book. Go to class. Ask lots of question. Study the slides. Work hard on solving these questions on your own. Talk to your friends about it. Talk to Jeff about it. Only after this should you read the posted solutions. Study the solutions. Understand the solutions. Memorize the solutions. The questions on the tests will be different. But the answers will be surprisingly close.

1. Prove that there is an uncomputable computation problem P_{hard} .
2. I could ask something to test if you understand both the statement that the halting problem is undecidable, the first order logic, the intuition, or the proof.
3. Accepting/Enumerating problem: Let $P_{UTM} = \{\langle "M_1", "M_2" \rangle \mid L(M_1) \cup L(M_2) \neq \{\}\}$.
 - (a) Give a deterministic algorithm that accepts/recognizes P_{UTM} . Explain why your solution is correct.
 - (b) Give a deterministic algorithm that enumerates P_{UTM} . Explain why your solution is correct.