COMP 301  
Assignment 5  
Due 2:40, Wednesday, November 19, 2003  
All problems are of equal value.

Reading  
Sipser, Chapter 4, sections 5.1, 5.3 and 6.3.

Practice  
Sipser, 4.1-12, 4.14, 4.16-21, 5.1, 5.2, 5.4-7, 5.9-13, 5.16.

To Be Handed In  
1. Is the following language decidable or undecidable? Prove your answer.  
   \[ L = \{ \langle M \rangle \mid L(M) = L(M)^R \} \]  
   Recall that \( L^R \) is the language consisting of the reverse of strings in \( L \).

2. Is the following language decidable or undecidable? Prove your answer.  
   \[ L = \{ \langle M \rangle \mid \text{there are an infinite number of TMs equivalent to } M \} \]  
   Recall that two TMs are equivalent if they recognize the same language.


4. Sipser, 5.15.

5. Show that every infinite Turing-recognizable language has an infinite Turing-decidable language as a subset. (Hint: Recall Sipser 3.16.)