CSE 431
Spring Quarter 2001
Assignment 5
Due Friday, May 4

All solutions should be neatly written or type set. All major steps in proofs and algorithms must be justified.

1. (10 points) Recall the following definition:

$$A_{TM} = \{\langle M, w \rangle : M \text{ accepts } w\}.$$

   Show that if L is Turing recognizable then $L \leq_m A_{TM}$.

2. (10 points) We know (from Theorem 5.23) that if $A \leq_m B$ and A is not Turing recognizable then neither is B. Use this and the fact that the complement of A_{TM} is not Turing recognizable to show that

$$D_{TM} = \{\langle M \rangle : L(M) \text{ is decidable}\}$$

   is not Turing recognizable.