

Lecture #14: Oracle Reductions

Supplement for Preparatory Viewing

Algorithm Used for an Oracle Reduction

The following algorithm can be used to decide membership in the language A_{TM} — assuming the existence of an algorithm that decides membership in NA_{TM} , so that the test at line 2 can be carried out.

```
boolean acceptInput ( $\mu : \Sigma_{TM}^*$ ) {  
  1.  if ( $\mu \in L_{TM+I}$ )  
  2.    if ( $\mu \in NA_{TM}$ ) {  
  3.      reject  $\mu$   
    } else {  
  4.      accept  $\mu$   
    }  
  } else {  
  5.    reject  $\mu$   
  }  
}
```