Tutorial 1

1. Give examples of:

   (a) sets which are not members of themselves,

   (b) sets which are members of themselves.

2. A common misunderstanding is to interpret Gödel's incompleteness theorem as showing that there are truths that cannot be proved. Where is the misunderstanding?

3. Denote by $N(P, v)$ the statement "the Turing machine P will *never* halt on input v" and consider the following set:

$$\mathbf{F} = \{N(P, v) \mid \ P \text{ is a Turing machine, } v \text{ in an input and } N(P, v) \text{ false}\}.$$

   (a) Is the set $\mathbf{F}$ computable?

   (b) Does the set $\mathbf{F}$ contain an infinite computable subset? Justify your answer in each case.