Philosophy 160
Undecidability and incompleteness

Answer the following questions. I prefer that you type your answers, but if you do not have easy access to a printer you may write them neatly. If you write them on a different sheet of paper, write the question out above each answer.

1. What does it mean to say that a formal system is complete?

A formal system is complete iff every valid wff is derivable.

2. What does it mean to say that a formal system is decidable?

A formal system is decidable if there is an effective, i.e., purely mechanical, method for determining whehter any formula is valid or invalid.

3. What is an example of a formal system that is both complete and decidable?

Propositional logic.

4. What is an example of a formal system that is complete but undecidable?

Predicate logic.

5. What does Gödel's incompleteness theorem demonstrate?

Gödel's incompleteness theorem demonstrates the incompleteness of any formal system capable of representing basic arithmetical functions; specifically, in any such system there will always be valid formulas that can not be derived.