

PHILOSOPHY OF MATHEMATICS II/III

2nd Essay Questions

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All essays are due **TO BE ANNOUNCED**. Essays WILL NOT BE ACCEPTED after 19th November unless a satisfactory excuse is submitted. The only satisfactory excuses are illness or misadventure. Pressure of other work, or computer equipment failure, does not normally count as misadventure. For further information contact the II/III Coordinator, Dr M. McDermott. Work must be placed in the box at the SOPHI office, with the proper cover sheet attached. (Please make sure you keep a copy of your essay.) **Note: there are no late penalties here, because late essays will not be accepted AT ALL—subject to the above caveat.**

2500/3000 words—answer only one question

1. What do Gödel's Incompleteness Theorems have to tell us about the relation between provability in a formal system and the abilities of human mathematicians. Examine either the Lucas argument or Penrose's variant, and consider the responses to same. (Note that this goes slightly beyond material covered in the lectures.)
2. Examine the significance of Gödel's Incompleteness Theorems for Hilbert's Formalist-Finitist program. You may also discuss briefly their significance for Intuitionism—but be careful not to reproduce material from your first essay.
3. Write an essay on the constructible universe of sets L and whether or not it is equal to the full universe V . In other words, does $V = L$?
4. Describe and explain Penelope Maddy's *Set-Theoretic Naturalism*? (See paper in booklet.) Do you think it is a tenable position? How does it relate to Cantor's own form of realism?
5. *Platonism* may be thought of either as the doctrine that mathematical truth could outrun all conceivable mathematical methods of proof; or it could be the doctrine that mathematical entities (the entities that mathematical statements appear to refer to) have an existence that is independent of humans (so that topological spaces, say, would be as they are, whether we existed or not). Write an essay on this topic (being careful to remember that the subject is mathematics).