

M.A. EXAMINATION 2003

for Internal Students

PHILOSOPHY**Philosophy of Mathematics**

Thursday, 29 May: 10.00 - 1.00.

Answer THREE questions. Avoid overlap in your answers.

1. What problem does Plato pose about the nature of geometrical objects? What is the best solution to that problem?
2. 'Not only are there no such things as points without magnitude and lines without breadth; we cannot even conceive of such things.' Discuss.
3. EITHER (a) Assess Mill's claim that our knowledge that no two straight lines enclose a space is based on induction from the evidence of the senses.

OR (b) Is there a route to geometrical knowledge that is neither deduction from definitions nor induction from experience?
4. Assess the view that mathematical geometry is not about actual space but about possible space.
5. Is there a satisfactory way of interpreting numerical equations (such as: $3 \times 6 = 18$) without assuming that numerals denote abstract objects?
6. EITHER (a) Explain and assess Frege's view that a cardinal number attribution (such as: a helium nucleus has two protons) assigns an object to a concept?

OR (b) What difficulties face Frege's view that the cardinal number n is the class of all concepts with exactly n instances?
7. What, if anything, of Frege's logicist programme for arithmetic has survived the discovery of the inconsistency of his system?
8. The Quantifier Law of Excluded Middle (QLEM) is: For all x Fx , or, for some x it is not the case that Fx . Are the intuitionists right in claiming that QLEM should not be accorded the status of a law of logic?

TURN OVER

9. Granted that the system of Simple Type Theory advocated by Ramsey is consistent and mathematically comprehensive, is it a purely logical system?
10. Explain Hilbert's distinction between real and ideal propositions in mathematics. How and in what sense did Hilbert hope to show that the use of ideal propositions and classical logic in mathematics is reliable?
11. Does the large role of mathematics in empirically successful science give us our sole justification for believing mathematics true?
12. EITHER (a) Is pure mathematics the study of abstract structures?
OR (b) Is pure mathematics a body of useful fiction?

END OF PAPER