

UNIVERSITY OF LONDON

088 0270

BA EXAMINATION 2008

for Internal Students

This paper is also taken by Combined Studies Students

PHILOSOPHY

Optional Subject (s): Philosophy of Mathematics

Thursday, 1 May 2008:14.30-17.30

Answer THREE questions. Avoid overlap in your answers.

1. According to Aristotle, Plato treated the 'mathematical number' n as a collection of n indistinguishable units. Is there a coherent interpretation of this doctrine?
2. EITHER (a) What were Frege's grounds for distinguishing between the natural number 2 and the real number 2? Are those grounds persuasive?

OR (b) How is Frege committed to the existence of a number of all objects? Is that commitment tolerable?
3. Assess the following argument: 'Insofar as geometry is part of our theory of space, it is synthetic and knowable only *a posteriori*. Insofar as it traces the consequences of certain axioms, it is knowable *a priori* and analytic. But nothing that warrants the name "geometry" is at once synthetic and knowable *a priori*. So Kant's theory of geometry must be wrong.'
4. Compare Mill's account of the relationship between mathematics and its applications with Frege's account. Which account is to be preferred?
5. 'The fundamental problem with Mill's empiricism is that it cannot allow for the way simple arithmetical statements like ' $5 + 7 = 12$ ' are part of the criterion for judging whether someone has counted correctly.' Discuss.
6. Does the derivation of the Peano-Dedekind postulates from Hume's Principle justify belief in those postulates?

c.University of London 2008
UL08/441

TURN OVER

7. What is the 'Julius Caesar problem'? Can the problem be solved?
8. Why is Russell's Paradox a threat to logicism about arithmetic? Can it be averted by appeal to the doctrine of logical types?
9. Is there a good argument for abandoning the Law of Excluded Middle in mathematics?
10. EITHER (a) Are mathematical objects mental constructions?
OR (b) Can it be rational to believe that there are actually infinite sets or sequences?
11. Assess Hilbert's proposal for a finitist justification of non-finitary mathematics. Was this proposal reasonable at the time it was made?
12. Does the fact that pure mathematicians pay no attention to findings of empirical science when doing their research have a bearing on the Quine-Putnam claim that pure mathematical knowledge depends ultimately on empirical knowledge?
13. EITHER (a) 'Mathematics is a useful fiction.' Discuss.
OR (b) Is mathematical science a conservative extension of nominalized science?
14. 'Mathematics is the science of structure.' Discuss.

END OF PAPER