Imperial College
London

UNIVERSITY OF LONDON

BSc and MSci EXAMINATIONS (MATHEMATICS)

May-June 2005

This paper is also taken for the relevant examination for the Associateship.

M3H History of Mathematics

Date: Friday 20th May 2005   Time: 10 am − 12 noon

Answer TWO questions

Credit will be given for all questions attempted but extra credit will be given for complete or nearly complete answers.

Calculators may not be used.

       M3H

1. Discuss how the Babylonians found approximations to the square root of 2 by an iteration formula and derive three more approximations after taking 1 as a first approximation.

   Also explain some other Babylonian achievements in Algebra.

2. Give Euclid's construction, Proposition 1, "To describe an equilateral triangle on a given straight line", and also describe Euclid's construction, Proposition 2, "From a given point to draw a straight line equal in length to a given straight line".

3. Derive the procedure by which Viete [1540 - 1603] came to solve some cubic polynomial equations by trigonometric means. Give a simple example. Explain how Viete's idea can be, and was, used for higher-order equations, with an example.

4. Explain the meaning of "The Fundamental Theorem of the Calculus". Describe Barrow's proof of the theorem.

5. Write an essay on a topic of your choice from the History of Mathematics.
   Note

   (a) The essay topic must be one that has not been covered in the lectures.
   (b) The sources should be stated clearly.
   (c) The initiative shown will contribute substantially to the marks given.