
This is a most scholarly book. The presentation is in the style of a textbook; each of the six chapters being followed by a set of exercises and a bibliography. The book is accessible to anyone with a background of sixth form mathematics. To gain full advantage and make the methods described more illuminating it is well worth while working the text using modern notation. The exercises need careful thought and in some cases access to either the internet or a well-stocked library. Hints and answers to some of the numerical exercises would have been useful. There is a good table of contents and a comprehensive index.

The book begins with a brief but excellent outline of the beginnings of Islam. There follows short descriptions of the achievements of four Muslim scientists (Al-Khwārizmī, Al-Bīrūnī, Umar al-Khayyāmī (Omar Khayam) and Al-Kāshī). These were apparently the main contributors to science in the period 750 to 1450. The sources of Islamic mathematics are discussed with examples of the Arabic language and Arabic names.

Chapter 2 is concerned with Islamic arithmetic, in particular the work of the astronomer Kūshyār b. Labbān and his text Principles of Hindu reckoning. Explanations are given for addition and subtraction which are easy to follow. However, it is advisable to work the examples in longhand using modern notation, this particularly applies to the multiplication and division explanations which follow. The sections on decimal fractions and sexagesimal arithmetic are well written but great care is needed when working through the examples. The book abandons Kūshyār's methods for finding roots in favour of Jāshīd al-Kāṭshī's presentation in his book The calculator's key. Justifications are given for the methods of extracting roots. There is an excellent flow diagram for finding the fifth root of a number. This chapter ends with some inheritance problems.

Chapter 3 begins with an interesting and not generally known description of Euclidean straight edge and compasses. Their use is illustrated using the first three propositions in Book I of Euclid. Sources of Islamic geometry are examined with reference being made to Euclid and Archimedes. The Conics of Appollonius is discussed as it forms the basis for research into geometry and optics. An attempt was made to restore the eighth book. The research led to constructions for regular polygons and examinations of conic sections. The constructions of Ibrāhīm b. Sinan for the parabola and hyperbola are accompanied by good diagrams. Islamic dimension geometry is illustrated by constructions used in Islamic art and architecture. The elaborate designs in wood, tile and mosaic are introduced together with problems from a text On those parts of geometry needed by craftsmen. The chapter ends with five problems that require constructions using straight edge and compasses.

The next topic is unknown quantities, introduced using examples from Euclid. On the sphere and cylinder is mentioned. A great deal of Greek mathematics was known to the Islamic world. Al-Khwārizmī's ideas on the solution of the equation $x^2 + 21 = 10x$ is generalised with remarks on the various possibilities for the value of the discriminant. Thabit's geometric approach to solutions of equations of the forms $x^2 + px = q$ and $x^2 + q = px$ are demonstrated. Abu Kamil is shown to have extended Al-Khwārizmī's work. The arithmetization of algebra by Al-Kārāji is introduced being followed by the exposition of Al-Samawāl's rules for exponents. The classification and solution of cubic equations is explained by examples. This is a chapter that makes use of modern notation to explain the work of Islamic algebraists, and is well worth careful study. The exercises at the end of the chapter
are well chosen and are in the main based on or from original scripts.

Ancient tables of chords and sines at the beginning of chapter 5 are taken from Ptolemy's *Almagest* (according to Toomer). Explanations of their use are given. The mathematicians of the Islamic world extended ancient methods of trigonometry to the use of six functions (sine, cosine, tangent, cotangent, secant and cosecant) – their methods are explained. Abu l-Wafā’s proof of the addition theorem for sines is explained. An application of trigonometry is given using Al-Bīrūnī’s measurement of the Earth. Interpolation procedures are explained with an excellent extract from a table attributed to Ibn Yunus. The chapter ends with Al-Kāshī’s approximation to sine and the usual exercises and bibliography.

The final chapter is titled ‘Spherics in the Islamic world’. The basic facts known to the Greeks are reviewed with reference to important circles on the celestial sphere and the Earth. The stereographic projection is described; this requires concentrated study for understanding. Spherical trigonometry in Islam is illustrated by reference to the works of Habash al-Hāsib, Abu l-Wafā, Al-Bīrūnī and Abu Nasr Mansur ibn Iraq. A proof of the law of Sines by Abu l-Wafā for spherical triangles is explained. There follows a discussion of tables for Spherical Astronomy. Auxiliary tables of functions are mentioned with eight of the thirteen in the group explained. The chapter and book ends (apart from the usual exercises) with a solution for the problem of finding the direction of Mecca from a given locality; this facilitates Muslim prayer.

This is an excellent book full of information and thought-provoking ideas. It is worthy of careful study which will lead to a greater understanding of what the Islamic world has contributed to mathematics.

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The revolution in financial markets over the last thirty years or so has led to a similar revolution in the undergraduate mathematical curriculum. The mathematics of financial markets is material that students nowadays want to learn. It is seen, to quote the author’s preface, as ‘modern, sexy and likely to impress potential employers’. Thus many university mathematics departments have introduced such courses, or are developing them or contemplating doing so. One can take this much for granted these days; what varies from one institution to another is the extent of the prerequisites for the course, and the level of mathematical rigour aimed at.

The author has written his book to provide a course text for a single course on financial options, at final-year level, with absolutely minimal prerequisites. He needs essentially nothing beyond standard first-year calculus. In particular, he assumes no prerequisites in probability, statistics or numerical analysis, though as he says, any prior exposure here will help. These are strong restrictions, presumably intended to widen the potential audience as much as possible (at Strathclyde University, to include students taking various combinations of mathematics, statistics, economics, business etc.).

The range of financial topics covered is broadly the standard Black-Scholes theory: the Black-Scholes formula, hedging, sensitivity analysis (‘the Greeks’), volatility, American options. Results are generally not proved in full, or with full rigour, but neither are they pulled out of a hat. The treatment is lively and well