

The Green Lion's Preface

Euclid's *Elements* has stood for well over two millenia as the exemplar, not just of classical geometry, but of the axiomatic and deductive structure characteristic of all pure mathematics. Its range goes beyond what we think of as geometry, extending to the general theory of proportions, number theory, and an innovative and ingenious treatment of incommensurability.

Euclid speaks to us with a voice as clear and universal as laughter. The simplicity, clarity and elegance of Euclid's proofs and the beautiful sequence of their unfoldings both delight and instruct. They provide a paradigm of what constructing a proof means and an education in how it is done.

Why a New Edition of Euclid?

Students of Euclid have long been needing an unabridged one-volume edition of the *Elements*.

All thirteen books were included in Encyclopaedia Britannica's series, *Great Books of the Western World*, but that generally required purchase of the complete set of volumes. Even if one could acquire an individual volume, the presentation of the text was hardly suited to serious study. The type was tiny and so crammed on the page that there was no space for writing notes. The paper used for the pages was tissue-thin so that any attempt to make notes or mark the diagrams as one worked through the proof resulted in show-through and torn paper. It could be used for reference, which was the primary intent of that series, but it was not suited for anyone actually working through the propositions.

Dover has done us all the service of keeping in print a photo-reproduction of Heath's original Cambridge University Press translation and commentary, in three volumes. We are grateful for this and hope that they will continue to keep it in print. But that edition has several drawbacks for someone whose primary interest is in reading Euclid as opposed to reading Heath.

First there is the inconvenience of having the book divided into three volumes. One must cart them all around or risk not having the

right one in class or at hand. Even at home one finds oneself trying to remember which volume a particular proposition would be in. In class there is a tendency when working on the later books to stop carrying the earlier volumes, with the result that, when a question comes up about an early proposition, Euclid's wording or proof cannot be consulted.

Perhaps even more inconvenient and disruptive of the study of Euclid's actual text is the sheer volume of Heath's historical and scholarly commentary interspersing itself among the propositions. It makes it difficult to find propositions, and to move from one to the next requires carefully paging through extensive commentary looking for where Euclid's actual text resumes. One doesn't get a clean picture of the flow of Euclid's development, which is the great beauty of his work.

We ourselves have experienced these inconveniences as scholars and in the classroom. For these reasons and in response to many requests from other users and teachers of Euclid, Green Lion Press has prepared this one-volume, clean, student-friendly, Euclid-centered edition of the complete text of all thirteen books of *Elements*.

Design Features of this Edition

The design and layout of this Green Lion edition provide ample space around both text and figures, and between propositions, to allow for notes. Substantial, fine quality paper of high opacity has been used for durability under heavy use and to further support the reader's own annotations.

Type size of the proposition numbers, space between propositions, and size and placement of the running heads, make it easy to see which book and proposition one is looking at and to turn quickly and easily to another proposition one may wish to consult.

The typesetting is entirely new for crisp reproduction. Drawings have been newly lettered and largely redrawn. In some few cases, where the original diagram was confusing or hard to read (for example, XII. 16), they have been redrawn differently from Heath's diagrams.

In keeping with Green Lion standard practice, diagrams always appear on the same spread as any text which refers to them, being repeated as often as necessary to maintain this. The reader never needs to be paging back and forth to look at the diagram while following the steps of the proof, as in other editions.

Our extensive index includes the Greek for a large number of the

entries, comprising all the basic geometrical terminology, making it a valuable glossary of Euclid's mathematical language. It is designed to help students find the definitions of crucial terms as well as the chief propositions in which they are used.

Nevertheless, several fundamental Euclidean terms require more extensive introduction than a glossary can provide. For these we have provided a section on Euclidean terminology, where the reader will find discussions of same ratio and compound ratio, *reductio ad absurdum*, terms such as porism and lemma, and a review of the principal parts of a Euclidean proposition.

The Editor's Preface describes more of the features of this edition.

The Bones

Active users of Euclid will be interested in our companion volume, *The Bones*. This is a pocket reference edition of Euclid's *Elements* with diagrams and enunciations for every proposition, but no proofs. It allows one to quickly find a proposition one needs or remembers without having to leaf through so many pages. Sometimes one remembers what the diagram looks like and can most easily find it by scanning the diagrams. Other times one might want to look at the wording of the propositions' enunciations to find the right one.

For those who have often said to themselves or their classmates or colleagues, "Didn't Euclid have a proposition about that?" (as we certainly have), this little reference book will be the one to reach for in order to answer the question. We expect to issue it shortly after publication of the present volume.

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