A TEXT-BOOK OF GEOMETRICAL DEDUCTIONS: BOOK I. CORRESPONDING TO EUCLID, BOOK I

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JAMES BLAIKIE & W. THOMSON

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Trieste

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GEOMETRICAL DEDUCTIONS

BOOK I.

Corresponding to Euclid, Book I.

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PREFACE

THE object of this treatise is to afford a systematic course of training in the art of solving Geometrical Deductions or Riders. With this view it is divided into sections, each section consisting of three parts. There is first a deduction worked out in full, which is intended to serve as a model for the student. This is followed by a number of similar deductions, which are to be written out by the student, the figure being given in each case, and such hints regarding the mode of solution as experience shows are required by beginners. Lastly, each section contains some deductions to be accomplished without this aid, no figures or assistance being given except an occasional reference to the proposition on which the proof depends, or to a previous example.

As a rule it is desirable that the proofs should depend upon propositions of Euclid, and not upon previous examples, the only exception being in the case of certain standard theorems which are indicated in the text.

For convenience of reference, especially in the case of those who have used text-books other than Euclid's, the enunciations of Euclid's propositions are given in an Appendix.

It is not necessary, and perhaps not desirable, that on his first reading the student should work through every example in each section. He should in each case, however, write out a sufficient number to insure his mastery of the principles involved; the others will be found useful when he comes to revise.

Through the kindness of friends the book has been tested, when in proof, by actual work with pupils, and the satisfactory result of this experiment has encouraged the authors to believe that the treatise may be found generally useful.

They have to acknowledge valuable suggestions and assistance from Messrs. Butters, Clark, and Walker, Heriot's Hospital School, Edinburgh; Mr. R. F. Davis; the Rev. W. F. Failes, Westminster School; Mr. Hayward, Harrow School; Mr. Macdonald, Daniel Stewart's College, Edinburgh; Dr. Mackay, Edinburgh Academy; Rev. J. J. Milne; Dr. Muir, Glasgow High School; Professor Raitt, Glasgow Technical College; Mr. Robertson, Edinburgh Ladies' College; Rev. G. Style, Giggleswick School; Mr. Tucker, University College School, and other friends.

Additional parts, corresponding to the remaining books of Euclid, are in preparation.

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APPENDIX.

DEFINITIONS.

SYMBOLS.

$\therefore$	signifies	*therefore.*
$=$	"	*is equal to.*
$\equiv$	"	*is equal in every respect to, is congruent with,* or *is identically equal to.*

Congruent figures are such as can be made to coincide by superposition.

$\perp$	signifies	*is at right angles to* or *is perpendicular to.*
$\parallel$	"	*is parallel to.*
$>$	"	*is greater than.*
$<$	"	*is less than.*
$+$	"	*together with.*
$-$	"	*diminished by.*
$\triangle$	"	*triangle.*
$\angle$	"	*angle.*
rt. $\angle$	"	*right angle.*
▱	"	*parallelogram.*
AB^2	"	*square on* AB.
$AB \cdot CD$	"	*rectangle contained by* AB *and* CD.
$AB \sim CD$	"	*the difference between* AB *and* CD.

CHAPTER I.

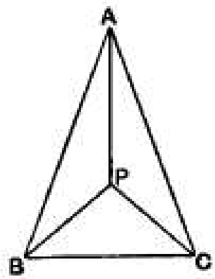
THEOREMS.

§ 1. (*Bookwork*, Euclid, I. 1-4.)

1. Any point on the bisector of the vertical angle of an isosceles triangle is equally distant from the extremities of the base.

Let **ABC** be an isosceles triangle, and let **AP** bisect its vertical angle; it is required to prove that

$$BP = CP.$$



In $\triangle$s BAP, CAP $\begin{cases} BA = CA, & \text{[Hypothesis.} \\ AP = AP, & \\ \angle BAP = \angle CAP; & \text{[Hypothesis.} \end{cases}$

$\therefore \triangle BAP \equiv \triangle CAP;$ [Euc. I. 4.

$\therefore BP = CP.$