

REVIEW of the book  
**Lessons in Geometry I Plane Geometry**  
by  
**Jacques Hadamard**  
Translated from the French by Mark Saul

Published by American Mathematical Society and Education Development Center in 2008. This is a translation of the 13th. edition. This book resulted (in 1898) from the need of textbooks, resources for the teaching of Mathematics. Gaston Darboux was named as editor of the set of these textbooks and he commissioned Jacques Hadamard to write the material for Geometry since he had taught on the high school level. Hadamard saw this work as important as he revised it twelve times. So, we come to this edition that was first published in 1947 and furnished the source of the translation of the present book.

The Hadamard's vision of Geometry is remarkably fresh, even after 100 years; the classical (axiomatic) approach is permanently balanced with the changes that appeared in the teaching of Geometry. Nowadays, especially in working with the beginners, we tend to rely, more and more, on the practice and intuition rather than on abstract (formal) arguments, even if the last are more precise and correct. In other words, the so called "pure" mathema-

tics becomes -at least regarding the teaching methods -applied mathematics. On the other hand, Hadamard is too experienced (he lived till the age of 97) as a mathematician and as a mathematical ideas teacher to forget the importance of the "Euclidean methods" as he called them. Once made the first steps in studying the Geometry (Euclidean Geometry), we must return to the axiomatic model and revisit those early starts and complete them. So, in the first chapter, the one devoted to angles, we can see a "scholastic" exposition in the Euclids rigorous logic tradition. In the same tradition are written: most of the Book I, especially Chapter III, Note A (On the Methods of Geometry), Note B (On Euclids Postulate), Note D, (On the Notion of Area), and many other smaller parts one can see everywhere in the book. The book contains: Translators Preface, four Authors Prefaces (to the 1st, 2nd, 8th, and 12th editions), Introduction (containing some basic definitions and notations), four Books, three Notes, Miscellaneous Problems, an Appendix devoted to Malfattis Problem and no Bibliography, references being made as footnotes.

- Book I "On The Straight Line" with seven chapters. After each chapter Hadamard proposes a set of exercises; at the end of each Book there are also presented some (more complicated) exercises (we will return below to this important issue).

- Book II "On the Circle" contains six chapters the last one being "On the Motion of Figures".

- Book III "On Similarity" having also seven chapters and other seven chapters grouped in "Complements to Book III". The reason for this is that the material from the Complements: Cross Ratio, Poles and Polars with re-

spect to a circle, Inversions, Cyclic Quadrilaterals, Peaucelliers Inverter, etc is far away from the Euclidean spirit. This Part has the same construction as a Book and we do not know the reasons why is this not a Book for itself.

- Book IV "On Areas" has "only" four chapters but Note D completes it.

- Note A "On the Methods of Geometry" is the place where J. Hadamard can be seen as a Master of mathematical exposition.

- Note B "On Euclids Postulate" needs no more explanations.

- Note C "On the Problem of Tangent Circles" shows us that Gergonnes method for finding the circles tangent to three given circles does not apply in all possible cases and is presented a complete solution.

- Note D "On the Notion of Area" is completing the Book IV solving the the logical fault of "defining" the notion of area in Euclidean setting.

- The part called "Miscellaneous Problems" contains eighty (more difficult) problems, some of them being taken from various contests.

- Appendix "On Malfatti's Problem". Here is presented a general solution of this famous problem first solved by Steiner.

The book is very easy to read since every single paragraph, exercise, theorem etc. has assigned a number. Number 1 belongs to the Introduction and is a definition of volume and the number 422 ends the "Miscellaneous Problems".

In Hadamard's opinion exercises are very important. Increasing the number of exercises as much as possible was the only rule that guided the Author in this work as he said in the Preface of the first edition. The problems (more than 450 of them) are well-suited to exploration using the

modern tools of dynamic geometry software. For this reason, the present edition includes a CD of dynamic solutions to select problems, created using Texas Instruments' TI-Nspire[trademark] Learning Software. The TI-Nspire[trademark] documents demonstrate connections among problems and will allow the reader to explore and interact with Hadamard's Geometry in new ways. In the same modern style the publishers posted, at <http://www.ams.org/bookpages/mbk-57/List-of-errors.pdf>, a list of errors.

In conclusion, the Hadamard's book is surprisingly modern even after 100 years have passed and is a rich source of mathematical and pedagogical ideas with a special emphasis on the solving of problems as the best way to study Geometry (and not only). Even if the book was originally intended for the use of the pre-college teachers it is useful as well to gifted high school students and college students, in particular, to people interested in geometry from different standpoints.

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Home » MAA Publications » MAA Reviews » Lessons in Geometry I: Plane Geometry. Lessons in Geometry I: Plane Geometry. When book I begins, the first topic is the angle. This choice allows him to obtain reflections and rotations fairly quickly toward the goal of studying congruences of the plane. Triangles follow, with the standard Euclidean results. Parallels are treated in chapter V of book I, for which the angles provide criteria for being parallel. The parallel postulate of Euclid takes the form given by Playfair: through a point not on a given line there is only one parallel to given line. The theory of parallels allows the author to treat translations via parallelograms. Book I closes with construction of Book recommendation on plane Euclidean geometry. Ask Question. Asked 9 years, 10 months ago. Greenberg is a remarkable historical tour through the various geometries of the plane as axiomatic systems, from geometry pre-Euclid through 19th century developments of non-Euclidean geometries through a careful analysis of the Hilbert axioms. It also has many pictures and many exercises of varying difficulty incorporated into the body of the text, so you really need to read it with pen in hand. Code Review. Magento. Software Recommendations. According to me the best book on Euclidean geometry is written by David M. Clark. Mathematically, Clark has chosen a new set of axioms that draw on a modern understanding of set theory and logic, the real number continuum and measure theory, none of which were available in Euclid's time. Euclidean Geometry: A Guided Inquiry Approach. This book will help you in strategies in solving troublesome Olympiad problems in Geometry but is good for students who are already confident in Competition Math. I like Evan Chen's clear and concise explanation style and the many excellent problems in the book have helped improve my Olympiad Geometry skills. 1. Donna Timms. An introduction to geometry in the plane, both Euclidean and hyperbolic, this book is designed for an undergraduate course. PROBLEMS IN PLANE AND SOLID GEOMETRY v.1 Plane Geometry. 495 Pages · 2005 · 3.95 MB · 20,739 Downloads. From the reviews: "A prominent research mathematician and a high school teacher have combined their efforts in order to The Advanced Geometry of Plane Curves and Their Applications - TU/e. The Advanced Geometry of Plane Curves and Their Applications (formerly titled: Advanced Plane Geometry) by C. Zwikker \$2 Elements of Geometry: Containing the First Six Books of Euclid, with a supplement on the quadrature of the circle and the geometry of solids; to which are added, Elements of plane and spherical trigonometry.