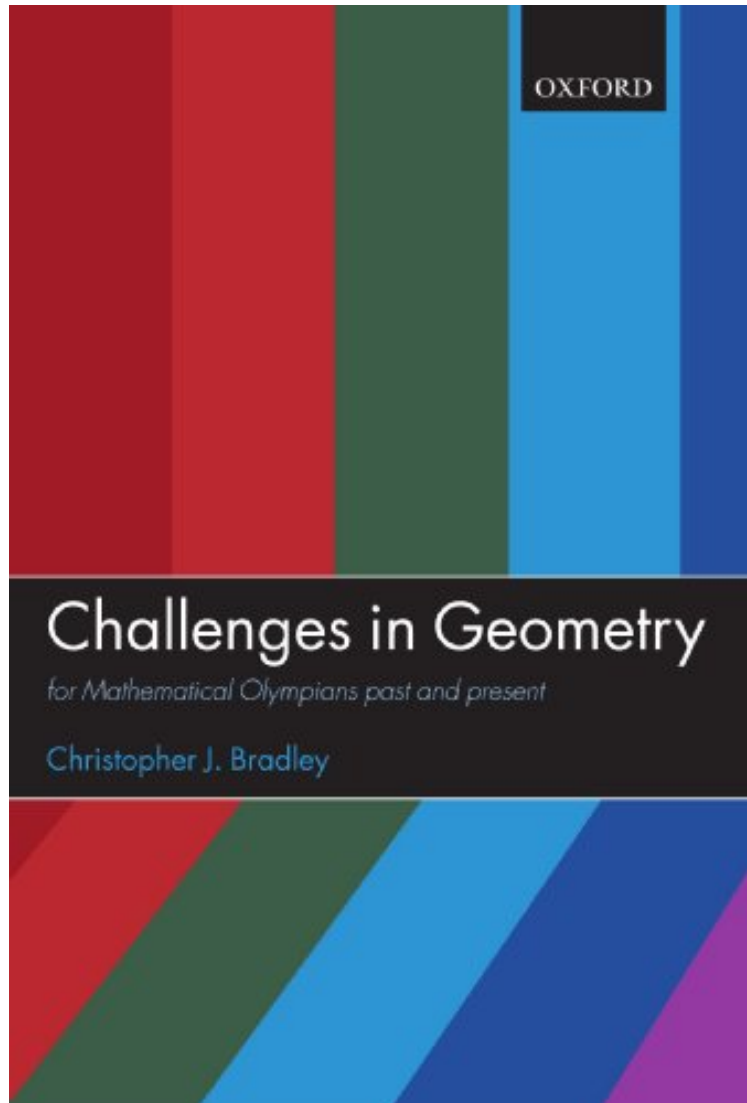


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Challenges in Geometry: for Mathematical Olympians Past and Present

Christopher J. Bradley

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#2133062 in Books Christopher J Bradley 2005-04-28Original language:EnglishPDF # 1 6.10 x .50 x 9.10l, .77 #File Name: 0198566921218 pagesChallenges in geometry | File size: 33.Mb

Christopher J. Bradley : Challenges in Geometry: for Mathematical Olympians Past and Present before purchasing it in order to gage whether or not it would be worth my time, and all praised Challenges in Geometry: for Mathematical Olympians Past and Present:

2 of 2 people found the following review helpful. This is certainly not a Geometry book !!By Osman NaThe title of the book is a misnomer. This book hardly deals with geometry, it is rather a number theory book. If you are preparing

for the International Mathematics Olympiad (IMO) and hope to learn geometry, this is not the book to study it from. Anything but this book. This is a number theory book I can say. I finished the first two chapters and now I gave up as I want to solve geometry problems. 3 of 3 people found the following review helpful. Number Theory and Combinatorics Problems Derived from Geometric Configurations By Tom Verhoeff Over the past couple of years, many books have appeared that concern mathematical problem solving, in particular, in the vein of mathematical olympiads. Challenges in Geometry is one of them, and it is in a class by itself. I would qualify it as 'a bit excentric'. Let me remind you that olympiads are for (talented) high school pupils. The title mentions geometry, but the book almost exclusively concerns combinatorial and number theoretic problems inspired by geometric configurations. For example: characterize all integer-sided triangles with an angle of 60 degrees. Using the cosine rule, this boils down to solving the diophantine equation $c^2 = a^2 - ab + b^2$. The formula density is truly amazing, in many places exceeding that of the accompanying prose. Only 10 pages are without formulae, and these include the preface (2 p.), references (2 p.), and index (3 p.). Fortunately, there are also 63 figures for the visually inclined. There is even some attention for the historic context of some problems. The reader does need to have a strong background in Euclidean geometry. Theorems by Apollonius, Ceva, de Moivre, Menelaus, and Ptolemy are applied without further explanation. But also modular arithmetic, Gaussian integers, unimodular matrices, determinants, partial derivatives, complex numbers, 2-variable Taylor series, and more pop up. This cannot be considered typical high school knowledge nowadays. A few of the problems treated by Bradley are more widely known, such as counting the number of lattice points in a lattice polygon (Pick's Theorem), and characterizing Euler bricks (rectangular blocks whose edges and face diagonals all have integer lengths) and the related -but as yet undiscovered- perfect cuboid (which in addition has an integer main diagonal). The proof style is quite terse. This makes for quick reading and helps maintain a good overview. But the proofs contain 'rabbits' pulled from the hat, without any guidance, thereby hindering the understanding. The book offers many exercises, all with solutions (15 p.). The appendix treats areal co-ordinates, also known as Barycentric co-ordinates; a useful topic hardly treated in textbooks. This makes the book a good resource for olympiad coaches, but prospective olympians might well be scared off.

The International Mathematical Olympiad (IMO) is the World Championship Competition for High School students, and is held annually in a different country. More than eighty countries are involved. Containing numerous exercises, illustrations, hints and solutions, presented in a lucid and thought-provoking style, this text provides a wide range of skills required in competitions such as the Mathematical Olympiad. More than fifty problems in Euclidean geometry involving integers and rational numbers are presented. Early chapters cover elementary problems while later sections break new ground in certain areas and area greater challenge for the more adventurous reader. The text is ideal for Mathematical Olympiad training and also serves as a supplementary text for student in pure mathematics, particularly number theory and geometry. Dr. Christopher Bradley was formerly a Fellow and Tutor in Mathematics at Jesus College, Oxford, Deputy Leader of the British Mathematical Olympiad Team and for several years Secretary of the British Mathematical Olympiad Committee.

"Christopher Bradley's fascinating book, Challenges in Geometry: for Mathematical Olympians Past and Present, would make a wonderful addition to the personal library of coaches of mathematical competitions, as well as anyone who has an interest in the intersection of geometry and number theory...Challenges in Geometry offers a great treasure of interesting problems, potential avenues of exploration and research for students, and new insights into rational geometry." --The Mathematical Association of America "Most books are written with the intent that they can be read in a linear order. Bradley seems to have written this book with a different intent--it can be played with in any order...The book is a smorgasboard, with full chapters on integer-sided triangles, circles or spheres that touch, rational points on curves, and areal coordinates." --CHOICE About the Author Dr. Christopher Bradley was formerly a Fellow and Tutor in Mathematics at Jesus College, Oxford, Deputy Leader of the British Mathematical Olympiad Team and for several years Secretary of the British Mathematical Olympiad Committee.