Record Nr. UNINA9910136292503321 Autore Siklos Stephen **Titolo** Advanced problems in mathematics : preparing for university / / Stephen Siklos Open Book Publishers, 2016 Pubbl/distr/stampa Cambridge, England:,: Open Book Publishers,, 2016 ©2016 **ISBN** 1-78374-145-7 1-78374-144-9 1 online resource (174 pages): illustrations; digital, PDF file(s) Descrizione fisica Collana **OBP Series in Mathematics** 510.711 Disciplina Soggetti Mathematics - Study and teaching (Higher) Calculus Geometry Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Description based upon print version of record. Nota di contenuto About this book -- STEP -- Worked Problems : Worked problem 1 : Worked problem 2: Problems-- ‡a P1 An integer equation P2 Partitions of 10 and 20 P3 Mathematical deduction P4 Divisibility P5 The modulus function P6 The regular Reuleaux heptagon P7 Chain of equations P8 Trig. equations P9 Integration by substitution P10 True or false P11 Egyptian fractions P12 Maximising with constraints P13 Binomial expansion P14 Sketching subsets of the plane P15 More sketching subsets of the plane P16 Non-linear simultaneous equations P17 Inequalities P18 Inequalities from cubics P19 Logarithms P20 Cosmological models P21 Melting snowballs P22 Gregory's series P23 Intersection of ellipses P24 Sketching x m (1 - x) n P25 Inequalities by area estimates P26 Simultaneous integral equations P27 Relation between coefficients of quartic for real roots P28 Fermat numbers P29 Telescoping series P30 Integer solutions of cubics P31 The harmonic series P32 Integration by substitution P33 More curve sketching P34 Trig sum P35 Roots o ‡a f a cubic equation P36 Root counting P37

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Sommario/riassunto

This book is intended to help candidates prepare for entrance examinations in mathematics and scientific subjects, including STEP (Sixth Term Examination Paper). STEP is an examination used by Cambridge colleges as the basis for conditional offers. They are also used by Warwick University, and many other mathematics departments recommend that their applicants practice on the past papers even if they do not take the examination. Advanced Problems in Mathematics is recommended as preparation for any undergraduate mathematics course, even for students who do not plan to take the Sixth Term Examination Paper. The questions analysed in this book are all based on recent STEP questions selected to address the syllabus for Papers I and II, which is the A-level core (i.e. C1 to C4) with a few additions. Each question is followed by a comment and a full solution. The comments direct the reader's attention to key points and put the question in its true mathematical context. The solutions point students to the methodology required to address advanced mathematical problems critically and independently. This book is a must read for any student wishing to apply to scientific subjects at university level and for anybody interested in advanced mathematics.