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Arens, Tilo; Busam, Rolf; Hettlich, Frank; Karpfinger, Christian; Stachel, Hellmuth
Basic knowledge for the study of mathematics. Analysis and linear algebra with cross connections. With contributions by Klaus Lichtenegger. (Grundwissen Mathematikstudium. Analysis und Lineare Algebra mit Querverbindungen.)

Heidelberg: Springer Spektrum (ISBN 978-3-8274-2308-5/hbk; 978-3-8274-2309-2/ebook). xii, 1172 p. (2013).

This course is very useful for obtaining a basic knowledge in mathematics. In 1172 pages (26 chapters), the authors cover the main part of analysis and linear algebra. This book impresses by the form of its presentation. The introduced notions are doubled by numerical examples, or some small applications, in order to obtain a good understanding. The book deals with notions of set theory, logic, algebraic structures (groups, rings, fields, homomorphisms), sets of real numbers, linear systems, vector spaces, analytic geometry, sequences (convergence), continuous functions, matrices, determinants, differentials and integrals. The exercises and problems attached are firstly solved by indications, then complete solutions are provided.

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Classification: I15 H15 A15

Keywords: analysis; linear algebra; inequalities; functions; logic; sets; real numbers; linear systems; vector space; analytic geometry; sequences; linear applications; determinants; Riemann integral; metric spaces; number theory; optimization

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