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ZMATH 2011c.00614

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Principles of linear algebra with Maple.

Pure and Applied Mathematics. A Wiley Series of Texts, Monographs and Tracts. Hoboken, NJ: John Wiley & Sons (ISBN 978-0-470-63759-3/hbk). xiv, 596 p. (2010).

In the book the basics of linear algebra are presented, several applications are discussed and it is explained how one can use `Maple` for doing computations in linear algebra. In the first chapter a short introduction to `Maple` is given. In Chapters 2 and 3 matrix operations and methods for solving systems of linear algebraic equations are explained. Chapter 4 is devoted to the application of systems of linear equations and matrix multiplication in geometry, curve fitting, and economics. In Chapter 5 the computation of the determinant and the inverse of a matrix as well as Cramer's rule are explained. The topics of Chapter 6 are vectors and operations with vectors. In Chapter 7 some problems of computer graphics are discussed, e.g. the rotation of surfaces and curves about any line passing through the origin. Chapter 8 contains basics on dependent and independent sets of vectors as well as on the basis and dimension of subspaces. In Chapters 9 and 10 linear maps are described by means of matrices and properties of the maps are discussed. Least-squares fits and pseudoinverses are the topics of Chapter 11. In the last chapter the computation of eigenvalues and eigenvectors is explained. At the end of each section homework problems and `Maple` problems are formulated. The homework problems are problems which should be solved without `Maple`. These problems should deepen the understanding of the presented topics. `Maple` problems are problems which are computationally too expensive for solving by hand. *Michael Jung (Dresden)*

Classification: H65 N35 R25
Keywords: Linear algebra, `Maple`, systems of linear equations; matrix operations; Gauss algorithm; determinants, inverse of a matrix; eigenvalues; eigenvectors; Cramer's rule; vectors; computer graphics; linear maps; least squares fits; textbook; curve fitting; pseudoinverses