W.M. Seiler 8082
Interdisziplinäres Zentrum für Wissenschaftliches Rechnen, Universität Heidelberg, 69120 Heidelberg, Germany
Zblno.: DE018624435
Author: R. Enns, G. McGuire
Title: Computer algebra recipes for classical mechanics
Source: Birkhäuser, Boston 2003
Class.:
Primary Class.: 70-04
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Keywords: computer algebra, mechanics
Review: This is a textbook discussing the use of computer algebra for computations in elementary classical mechanics. It is based on the system Maple 8; no prior knowledge of it is required. In contrast, the reader must use some other textbook on mechanics in order to learn the necessary physics. Each section solves a concrete mechanical problem (explained in form of a story). The emphasis is clearly on the computational side: each Maple command is given explicitly (usually with output, if it is not too lengthy). In contrast, the mechanical background of the problem and its solution is not really discussed but assumed to be clear for the reader.
The book consists of six chapters: Vectors and Kinematics, Newtonian Mechanics, Vector Calculus, Newtonian Dynamics I and II, Lagrangian & Hamiltonian Dynamics. Each chapter contains under the name Supplementary Recipes a number of exercises. The book gives a solid introduction into the basic use of Maple. Besides the standard commands for the manipulation and simplification of expressions, the emphasis is on the visualisation tools; no advanced libraries are used. The book should serve well as an exercise or lab book accompanying a standard course on elementary classical mechanics.
Remarks: