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1 1 why study solitons the last century of physics which was initiated by maxwell s completion of the theory of electromagnetism can with some justification be called the era of linear physics jith few exceptions the methods of theoretica 1 physics have been dominated by linear equations maxwell schrodinger linear mathematical objects vector spaces in particular hilbert spaces and linear methods fourier transforms perturbation theory linear response theory naturally the importance of nonlinearity beginning with the navier stokes equations and continuing to gravitation theory and the interactions of par ticles in solids nuclei and quantized fields was recognized however it was hardly possible to treat the effects of nonlinearity except as a per turbation to the basis solutions of the linearized theory during the last decade it has become more widely recognized in many areas of field physics that nonlinearity

can result in qualitatively new phenom ena which cannot be constructed via perturbation theory starting from linear ized equations by field physics we mean all those areas of theoretical physics for which the description of physical phenomena leads one to consider field equations or partial differential equations of the form  $1\ 1\ 1\ t$  or tt f x for one or many component fields ht x y or their quantum analogs

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a concise and up to date introduction to mathematical methods for students in the physical sciences mathematical methods in physics engineering and chemistry offers an introduction to the most important methods of theoretical physics written by two physics professors with years of experience the text puts the focus on the essential math topics that the majority of physical science students require in the course of their studies this concise text also contains worked examples that clearly illustrate the mathematical concepts presented and shows how they apply to physical problems this targeted text covers a range of topics including linear algebra partial differential equations power series sturm liouville theory fourier series special functions complex analysis the green s function method integral equations and tensor analysis this important text provides a streamlined approach to

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intended to follow the usual introductory physics courses this book contains many original lucid and relevant examples from the physical sciences problems at the ends of chapters and boxes to emphasize important concepts to help guide students through the material

well rounded thorough treatment introduces basic concepts of mathematical physics involved in the study of linear systems with

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