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A classic, extensively studied nonlinear problem is the dynamics of a pendulum under the influence of gravity. Using Lagrangian mechanics, it may be shown that the motion of a pendulum can be described by the dimensionless nonlinear equation $\ddot{\theta} + \sin \theta = 0$ where gravity points "downwards" and θ is the angle the pendulum forms with its rest position, as shown in the figure at right.

Nonlinear system - Wikipedia

Chaos theory is a branch of mathematics focusing on the behavior of dynamical systems that are highly sensitive to initial conditions. "Chaos" is an interdisciplinary theory stating that within the apparent randomness of chaotic complex systems, there are underlying patterns, constant feedback loops, repetition, self-similarity, fractals, self-organization, and reliance on programming at the ...

Chaos theory - Wikipedia

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Page 6 MATHEMATICAL SOFTWARE PACKAGES IN CHEMICAL ENGINEERING 2. STEADY STATE MATERIAL BALANCES ON A SEPARATION TRAIN 2.1 Numerical Methods Solution of simultaneous linear equations.

THE USE OF MATHEMATICAL SOFTWARE PACKAGES IN CHEMICAL

1968 Taylor, Pister, and Herrmann extended Herrmann's work to orthotropic materials. S.W. Key extended it to anisotropy [1969]. 1971 First release of MARC – the world's first commercial, nonlinear general-purpose FEA code.

Technical Paper - MSC Software Corporation

The Japan Society of Fluid Mechanics (JSFM) originated from a voluntary party of researchers working on fluid mechanics in 1968. The objectives of the society were to discuss about scientific and engineering problems relevant to fluid motion among researchers working in Physics, Engineering and the interdisciplinary fields and to assist in their research activities.

Fluid Dynamics Research - IOPscience

5.2.1 How to solve equations of motion for vibration problems . Note that all vibrations problems have similar equations of motion. Consequently, we can just solve the equation once, record the solution, and use it to solve any vibration problem we might be interested in.

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