

Integrating Equations of Motion in Mathematica

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Double-click the cell brackets on the right to open and close them.

Introduction

There is really only one thing you need to know about *Mathematica* — it can do almost anything you would want to do mathematically. Of course, getting it to do anything is quite another matter. What you will learn here is probably much less than 1% of what *Mathematica* is capable of.

This is a quick tutorial on how to use *Mathematica* for many of problems you will be solving this semester. For example, you will numerically solve ordinary differential equations (equations of motion), solve systems of algebraic equations, and plot many types of functions. If you have suggestions, comments, or corrections, please send them to me at the above email address.

■ Executing Commands in *Mathematica*

Commands are entered in “cells”. The vertical lines you see on the right are cell brackets and they define boundaries between groups of objects. Each cell has associated with it a certain set of attributes, but you only need be concerned with a couple of them. The cell containing this paragraph is a text cell as you can see in the toolbar at the top of the window. A text cell is used for adding comments and explanation to a notebook and is not executable. You can only do mathematics in *Mathematica* withing executable cells. Any time you start a new cell, it is an “input cell” by default and *Mathematica* commands can be executed there since it is executable. Below you see an example of an input cell with a *Mathematica* command and the resulting output cell. The command is executed by placing the cursor anywhere within the cell and pressing either **Shift-Return** or **Enter**.

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