

Lab 4: Derivatives

Lab4.ma is a *Mathematica* notebook that shows how to obtain and use the partial derivatives of a function of two variables. It defines the gradient as an operator on such functions, and shows how to use this operator to obtain and analyze critical points. It also defines the discriminant operator and shows how to use this to distinguish extreme points from saddle points. The **CountourPlot** command is then used to make these distinctions obvious.

Like all *Mathematica* notebooks, this one is used by opening its cells and executing its *Mathematica* commands. To open a cell, double-click on its cell bracket. To execute a *Mathematica* command, click on its cell bracket to select it, and then press the Enter key (not the Return key).

Lab4.wn explains how to work through **Lab4.ma** on the NeXT.

Author:

John R Hubbard
Maths & Computer Sci
U of Richmond, VA 23173
hubbard@newton.urich.edu

Category:

Mathematics

Usage:

This software is used by students enrolled in Multivariate Calculus at the University of Richmond.

Version:

This software uses Mach 2.0
and *Mathematica* 2.0

References:

This software refers to the two books:

Calculus and Analytic Geometry, Fourth Edition

by Sherman K. Stein (McGraw-Hill, 1987).

A Guidebook to Calculus with Mathematica

by Philip Crooke and John Ratcliffe (Wadsworth, 1991).