MVE041 Flervariabelanalys 2015 Passing/Mastery Week 3

1 Passing Part

§13.1

- Know the definitions of local and global maximum/minimum points, saddle points, critical points, and singular points.
- Compute and classify the critical (stationary) points for a system of equations.

§13.2, 13.3

- Compute extreme values of functions $f(x, y)$ defined on restricted domains for relatively simple functions and domains.
- Compute extreme values of functions $f(x, y)$ or $f(x, y, z)$ with constraints $g(x, y) = 0$, or $g(x, y, z) = 0$ using the Lagrange multiplier method for relatively simple equation systems.

§13.7

- Understand Newton's method and be able to set up a Newton iteration to solve a system of nonlinear equations.

§14.1, 14.2

- Evaluate simple double integrals (e.g. simple domain or with symmetry) by inspection.
- Evaluate the integral of a function $f(x, y)$ over a rectangle in the xy-plane.
- Know the basic properties of the double integral, e.g. pg 811 of *Adams and Essex*.

2 Mastery Part

§13.2, 13.3

- State and prove the Lagrange multiplier theorem (Theorem 4, pg 759 of *Adams and Essex*).
- Solve extreme value problems as in the passing part, but in more complicated settings. For example, with more complicated functions, higher dimensions, and multiple constraints.