MVE041 Flervariabelanalys 2015 Passing/Mastery Week 4

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1 Passing Part

§14.2 Integration over Regular Domains

- Use a double integral and cartesian coordinates to find the area of a bounded region in the plane.
- Compute the double integral in cartesian coordinates of a function over a bounded region in the plane.

§14.4 Integration in Polar and other coordinates

- Compute the double integral in polar coordinates of a function defined on a bounded region in the plane.
- Know the transformations between cartesian and polar coordinates as well as the area element in both coordinate systems. Be able to compute the area element in polar coordinates using the Jacobian determinant.
- Understand what it means for a map $\mathbb{R}^2 \to \mathbb{R}^2$ to be one-to-one.
- Can compute the area element in a new system of coordinates, for given variable transformations.

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2 Mastery Part

§14.4 Integration in Polar and other coordinates

- Define and use a suitable variable substitution to compute a given double integral.