

Math 241 Section 13.1: Functions of Several Variables

Dr. Justin O. Wyss-Gallifent

1. Basic Definitions:

Defined functions of two and three variables. Mentioned both $z =$ and $f(x, y) =$ notation and both $w =$ and $f(x, y, z)$ notation. Mentioned that every function in two variables is an equation in three, but the reverse is not always the case. Similarly for functions of three variables and equations in four.

2. Examples:

Drew lots of pictures, including:

- Paraboloids
- Cones
- Spheres
- Cylinders
- Planes
- Ellipsoids
- Parabolic sheets

I encouraged them to think of new types, like how could they center a cylinder around something not an axis or how could a paraboloid be made to open around the x-axis.

3. Level Curves and Surfaces:

Defined level curves and level surfaces and did examples. Pointed out that the graph of a function of one variable is the level surface for a function of two variables and the graph of a function of two variables is the level surface for a function of three variables.