Math 223 Week 3 Lectures: Sections 11.3, 11.4

Section 11.3: Partial Derivatives

Definition for $f : \mathbb{R}^2 \to \mathbb{R}$

Geometric interpretation in terms of graph

Tangent plane calculation

Approximation: $L(x, y) = f(x_0, y_0) + f_x(x_0, y_0)(x - x_0) + f_y(x_0, y_0)(y - y_0)$

Higher derivatives

Clairaut's Theorem page 613.

Work through problem 79, page 617. See Mathematica notebook.

Section 11.4: Tangent Planes and Linear Approximations

Review the tangent plane and approximation material.

Define differential, page 621, formula 10.

Do number 28. Use negative values for input differentials, compute dV, and call this the amount of metal.