Study Guide for Exam 2

13.2: Vectors in general. Know what a vector can represent: a **velocity vector**, **force**, **acceleration**. Know the algebraic laws of vector addition, and scalar multiplication. Vector can also be a vector in n dimensions, for n bigger than 3.

13.3: Dot product. Know both the algebraic and the geometric definition of the **dot product** (be able to compute with either). Know how to compute angle from the dot product. Know how to write down an **equation of a plane** knowing the **normal vector** and a point in the plane. Know **projections**, know how to decompose a vector into a parallel part and an perpendicular part.

13.4: Cross product. Know both the algebraic and the geometric definition of the **cross product** and be able to compute with either. Know the basic properties of the cross product. Be able to find **equation of a plane** through three points using the cross product.

14.1: The partial derivative. Know the definition of the **partial derivative**. Be able to **estimate** using data (table or contour plot).

14.2: Computing partial derivatives algebraically. Be able to compute partial derivatives algebraically given a formula.

14.3: Local linearity and the differential. Be able to approximate functions using the **tangent plane**. Be able to find the tangent plane given a table of data. Know what a **differential** is.

14.4: Gradients and directional derivatives in the plane. Know what is the **gradient vector**. Know how to compute a **directional derivative**. Know the properties of the gradient vector.

14.6: The chain rule. Be able to compute derivative using the chain rule.