Exam #2 objectives

For Exam #2, a well-prepared student should be able to

- determine the domain and range of a function of two variables
- plot or describe both level curves and the graph of a simple function of two variables
- determine the domain and range of a function of three variables
- plot or describe level surfaces of a simple function of three variables
- analyze the limit of a function of two or more variables
- analyze continuity of a function of two or more variables
- use path limits to show that a given limit does not exist for a function of several variables
- state the definition of a partial derivative (as limit of a difference quotient)
- compute the partial derivatives of a function of several variables
- understand and use equality of mixed partial derivatives (when relevant)
- read, with understanding, the various notations for partial derivatives
- state and use an appropriate interpretation (rate of change or slope) of the partial derivatives of a function of several variables
- use an appropriate chain rule to compute partial derivatives for a given composition of functions
- understand the structure of level curves/surfaces in a zoomed-in view at a point
- articulate how gradient vectors are related to level curves/surfaces and greatest rate of change
- compute a gradient vector field given a function formula (in cartesian coordinates)
- compute a directional derivative given a function, an input, and a direction
- state and use an appropriate interpretation (rate of change or slope) of a directional derivative of a function of several variables