The first exam will be administered in class **Friday, February 1st**. No makeup exams will be given. The exam will cover sections 13.1-13.6, 14.1, and 14.2. No electronic devices will be allowed including cell phones, laptops, or calculators, but you may bring a 3×5 inch notecard with notes and/or formulas on the front and back. **You must bring your student ID to the exam**. Scratch paper will be provided.

You should study old homework, quizzes, lecture notes, and these sections of the textbook. You may also find it helpful to do problems in the textbook for each section and the Chapter 13 Review.

Skills List

In general you are expected to know and understand all definitions and theorems covered. The following is a list of skills you will likely need to be able to apply on the exam. This list is meant to be a guide and is not exhaustive. In particular, you should be able to:

- Compute the distance between points in $\mathbb{R}^3$.
- Find the equation of a sphere or complete the square to identify the center and radius of a sphere.
- Perform vector operations including vector addition, subtraction, and scalar multiplication in $\mathbb{R}^2$ and $\mathbb{R}^3$.
- Find and interpret the magnitude of a vector.
- Find and interpret geometrically the dot product of two vectors.
- Compute the angle between two vectors.
- Find and interpret geometrically the cross product of two vectors.
- Find the area of shapes in the plane (parallelogram, triangle) and the volume of a parallelepiped.
- Find the parametric equations and vector equation of a line given some information (two points on the line or a point and a direction vector).
- Find the scalar equation and linear equation of a plane given some information.
- Find the angle between two planes.
- Identify and sketch standard types of quadric surfaces.
- Find the equation for a quadric surface given some information.
- Sketch or identify the graph of a space curve defined by a vector-valued function.
- Find a vector function that represents the intersection of two surfaces.
- Compute and interpret geometrically the derivative of a vector function.
- Find the parametric equations or a vector equation for the tangent line to a vector function.
- Use differentiation rules for vector functions.
- Compute indefinite and definite integrals for vector functions.