Review information for Calculus III Test III.

The test will cover sections 13.6–13.7 and 14.1–14.4. Here is a list of useful problems to review in the Chapter Reviews on pages 881–882 and 918–919. For the most part, the problems on the test will be very similar to these.

Chapter 13 Exercises: 26–34, 37–48.

Given an equation describing a surface in space, you should be able to sketch the traces of that surface. In case the surface is quadric, you should be able to identify and describe the surface (#26–34). Your description can be an accurate picture, a verbal description, or some combination of both. Any verbal description should include the name of the surface and some indication of the direction it faces.

You should be able to move between cartesian, cylindrical, and spherical coordinates in space (#37–39). This includes not only representing single points in all three coordinate systems, but also rewriting equations using different coordinates (#44–47). You should also be able to describe the graphs of simle equations written in cylindrical or spherical coordinates (#40–43). Finally, you should be able to describe accurately a solid spatial region bounded by coordinate inequalities (#48), as well as find inequalities that describe a given region.

Chapter 14 Exercises: 1, 4–6, 8–13, 15, 17–20.

Given a parametrized curve, you should be able to: describe it (in simple cases) (#1), differentiate and integrate it (#5, et al.), find its tangent line at a point (#4, 6, 9, 11), find its length (#8), reparametrize it by arc length (#10), find its curvature (in various ways) (#11, 12, 13), find its normal and binormal vectors (#11), and find its normal and osculating planes (#6, 15). If the parametrized curve represents the motion of a particle in time, you should be able to find its velocity, speed, and acceleration (#17). Similarly, given acceleration and/or velocity, you should be able to find the position function (#18). You should also be able to resolve the acceleration into tangential and normal components (#20). If the motion is that of a projectile, you should be able to use Newton's second law to answer questions about the path of the projectile (#19).