

Math 17: Study Guide for Final Exam

Know how to:

- Compute double integrals using iterated integrals (Types I and II)
- Convert from rectangular to polar coordinates, and visa versa
- Compute double integrals in polar coordinates (remember the extra r)
- Sketch solids that involve planes, cylinders, paraboloids, spheres, cones
- Compute triple integrals in the 3 cases of simple solids
- Convert points and equations between spherical and rectangular coords
- Compute triple integrals in spherical coordinates (remember $\rho^2 \sin \phi$)
- Sketch vector fields in the plane
- Parametrize circles, line segments, and graphs of functions
- Compute line integrals in $\int_C \vec{F} \cdot d\vec{r}$ and $\int_C f dx + g dy + h dz$ form
- Show a vector field is conservative and find a potential function
- Use the Fundamental Theorem of Work Integrals
- Use Green's Theorem to compute $\int_C f dx + g dy$ for closed curves C
- Parametrize surfaces (graph of a function, sphere, and "cylindrical" cases)
- Compute $\frac{\partial \vec{r}}{\partial u} \times \frac{\partial \vec{r}}{\partial v}$ and $\left\| \frac{\partial \vec{r}}{\partial u} \times \frac{\partial \vec{r}}{\partial v} \right\|$
- Compute $\iint_{\sigma} f(x, y, z) dS$, for $\vec{r}(u, v)$, graph of a function, and spheres
- Use surface integrals to find surface area
- Find the positive orientation on a parametrized surface
- Compute the flux of a vector field $\Phi = \iint_{\sigma} (\vec{F} \cdot \vec{n}) dS$
- Compute the divergence and curl of a vector field
- Use Gauss' Divergence Theorem to compute $\iint_{\sigma} (\vec{F} \cdot \vec{n}) dS$, for closed surfaces
- Find the orientation on a boundary curve relative to the surface orientation
- Use Stokes' Theorem to compute $\int_C \vec{F} \cdot d\vec{r}$
- Interpret curl as circulation density

Final Exam

Tuesday 3/20/07 9:00-11:00 AM