Math 263B **Guide for the Final Exam**

- The final deadline for turning in any late matlab or good problems is at the final exam.

The final exam is on Tuesday, March 18 at 7 p.m. in **219 Morton**, which is across the hall from our regular classroom. Calculators are not permitted. This is a common final with all students taking 263B. Make-up exams for common finals are only given in case of conflicts, following the rule outline on the Registrar's web page. Only the course coordinator (`math263coord@math.ohiou.edu`) can overrule this.

The exam will **not** cover sections 6.2, 7.5, and 7.6, which were optional and thus not studied by all 263B students. However, integrals such as $\int \sin^2(x)dx$, $\int \cos^2(x)dx$ and $\int \tan(x)dx$, which first appeared in section 6.2, may be needed to solve problems in later sections.

All other sections that we studied will be covered on the exam. The exam will consist of: "Roughly one homework problem from each section, maybe with the numbers changed. Some will be easy ones and some hard ones." The list of homework problems is therefore your best guide. There is a sample final on the course website from fall 2007.

Here are some practice problems from sections 9.1–9.3, which were not covered by the other tests.

1. Consider the parametric curve defined by $x = e^{2t}$ and $y = t + 1$.
   (a) Eliminate the parameter to find a Cartesian equation of the curve.
   (b) Sketch the curve and indicate with an arrow the direction in which the curve is traced as the parameter increases. Mark and label 3 points.
2. Consider the parametric curve defined by $x = 4 + t^2$ and $y = t^2 + t^3$.
   (a) Find $\frac{dy}{dx}$.
   (b) Find $\frac{d^2y}{dx^2}$. For which values of t is the curve concave upward?
   (c) Set up, but do not evaluate, an integral that represents the length of the curve for $0 \le t \le 2$.
3. Use the parametric equations of the ellipse, $x = a\cos\theta$, $y = b\sin\theta$, $0 \le \theta \le 2\pi$, to find the area that it encloses.
4. Consider the curve $r = \cos(2\theta)$ for $\frac{\pi}{4} \le \theta \le \frac{5\pi}{4}$ in polar coordinates.
   (a) Graph it. Mark and label 3 points.
   (b) Find the slope of its tangent line and the point corresponding to $\theta = 3\pi/4$.