Final Exam: Frequently Asked Questions

Math 195 Section 91

Wednesday July 22, 2009

What will the final exam be like?

There will be **18 questions** on the exam and it will last **120 minutes**. It will be worth 400 points.

As on the first exam, the final question will be **extra credit** with true/false questions.

Should I bring a calculator?

Absolutely not. Calculators are **forbidden**. You may bring the official Math 195 Paper Slide Rule, if you really want to.

How should I write down my answers?

Your task is not merely to find an answer—it is to provide an explanation. You will lose points if you surround an otherwise convincing argument with false statements (after all, once I have proved $2 = 1$, I can prove anything!). **Erase** untrue statements for full credit.

Is the exam cumulative?

Yes; the final exam will cover—and combine!—everything we have done so far. I have provided little boxes so you can check off the tasks that you feel prepared to do.

- ☐ Find the slope of a tangent line to a curve
- ☐ Find the slope of a tangent line to a curve given in polar coordinates
- ☐ Find distance between points in $\mathbb{R}^2$, $\mathbb{R}^3$, and $\mathbb{R}^n$
- ☐ Write vectors as a linear combination of other vectors
- ☐ Compute dot products
- ☐ Determine when vectors are orthogonal
- ☐ Find the angle between two vectors

- ☐ Normalize a vector
- ☐ Compute the norm of a vector
- ☐ Compute the cross product of two vectors in $\mathbb{R}^3$
- ☐ Find an equation for a line through a given point and in a given direction
- ☐ Find an equation for a plane through a given point and with a given normal vector
- ☐ Determine whether two lines intersect, are parallel, or are skew
- ☐ Find the point of intersection between a line and a plane
- ☐ Differentiate and integrate vector-valued functions
- ☐ Caclulate unit tangent vectors to a curve
- ☐ Find the angle of intersection between curves
- ☐ Differentiate a vector-valued function
- ☐ Compute a limit of a function of several variables
- ☐ Convert a limit from cartesian coordinates to polar coordinates
- ☐ Define continuity for functions of several variables
- ☐ Give an example of a limit that does not exist
- ☐ Compute partial derivatives
- ☐ Compute higher partial derivatives
- ☐ Give an example in which mixed partials commute
- ☐ Write down a linear approximation to a function
- ☐ Find the tangent plane to a function at a point
- ☐ Compute partial derivatives with the chain rule
- ☐ Compute the gradient of a function
- ☐ Compute directional derivatives
- ☐ Find critical points
- ☐ Find maximum and minimum values
- ☐ Use the second derivative test
- ☐ Optimize a function given a constraint with Lagrange multipliers
- ☐ Evaluate double and triple integrals
- ☐ Integrate a function over a rectangular region
- ☐ Integrate a function over a general region
- ☐ Apply Fubini's theorem
- ☐ Convert polar coordinates to cartesian coordinates.
- ☐ Evaluate integrals using polar coordinates
- ☐ Use cylindrical coordinates
- ☐ Convert cartesian coordinates to spherical coordinates.
- ☐ Use spherical coordinates
- ☐ Compute a Jacobian
- ☐ Find the area of a given region
- ☐ Compute the volume of a 3-dimensional region