Review for Final

Final Exam is Wednesday,

4:00 PM - 5:50 PM

Stag 233

For the exam, you may bring one side of an 8.5 by 11 inch sheet of paper with handwritten notes.

Lessons 11 and 12

- Find limits of functions of two or three variables
- Determine when limits do not exist
- Determine points of continuity
- Find partial derivatives

Lessons 13 and 14

- Review definition of differentiability
- Be able to use chain rule to compute derivatives and partial derivatives
- Use formulas for implicit differentiation for level curves and level surfaces
- Be able to compute gradients and directional derivatives
- Relation of gradients to level curves and maximum rate of change
- Relation of gradients to level surfaces and maximum rate of change
- Use gradients to compute tangent planes

Lessons 15 and 18

- Find tangent planes to surfaces $z = f(x, y)$
- Find tangent planes to level surfaces $F(x, y, z) = k$
- Double integrals
- Compute double integrals as iterated integrals
- Average value
- Change order of integration

Lessons 19 and 20

- Find double integrals over general (non rectangular) regions
- Use double integrals to compute area and volume
- Compute double integrals in polar coordinates ($dV = r \cdot drd\theta$)

Lessons 21 and 22

- Compute triple integrals over rectangular and general regions
- Change order of integration
- Use triple integrals to compute volume
- Be able to use triple integrals in cylindrical form ($dV = r \, dr \, d\theta \, dz$)
- Be able to use triple integrals in spherical form ($dV = \rho^2 \sin(\phi)d\rho \, d\phi \, d\theta$)

Lessons 16 and 17

- Be able to find critical point for functions of two and three variables
- Be able to find maximum and minimum values
- Use the second partials test to analyze critical points
- Use the method of LaGrange to find maximum values of $f(x, y)$ subject to the constraint $g(x, y) = k$
- Use the method of LaGrange to find maximum values of $f(x, y, z)$ subject to the constraint $g(x, y, z) = k$

Lessons 23 and 24

- Use integration to find average values and centers of mass
- Be able to compute 2 and 3 dimensional Jacobian determinants
- Be able to use the two and three dimensional change of variables formulas.