

Logistics

- The exam will be given in SB 120 & 128.
- You will have access to the computers so that you can use R, sage, and Mathematica.
- Be sure to indicate how you use the computer on the exam. **No mystery numbers or expressions, please.**
- Use good notation and show all work. Full credit will not be given if your answers are not sufficiently supported.
- The format will be similar to the previous tests.

Material covered

The final exam is cumulative. For lists of topics covered on the prior to Test 3, consult the review sheets for those tests. Here are some additional things to know:

1. Hypothesis Testing
 - (a) The 4 step process.
 - (b) The meaning and interpretation of a p-value
 - (c) Specific tests: 1-sample t , 2-sample t , paired t , 1-proportion, tests related to regression (see below)
 - (d) Relationship between hypothesis tests and confidence intervals.
2. More Regression. The emphasis will be fitting models using R and interpreting the output, not on the computational formulas going on behind the scenes.
 - (a) Regression models including higher order terms and interaction.
 - (b) Assumptions of the regression model and how to check them (e.g., using various plots).
 - (c) Intervals: CI for β_i , CI for mean response, PI for individual response.
 - (d) Hypothesis tests: Model utility test, test for a single parameter, model comparison test
 - (e) R commands for regression: `lm()`, `anova()`, `plot()`, `I()`

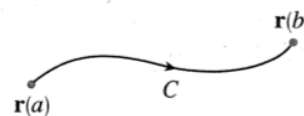
Information I will give you on the exam

1. The table of distributions (as on previous tests).
2. The bottom half of page 795 which contains some pictures and formulas for vector calculus. (You, of course, still need to know what these mean and when to use them.)

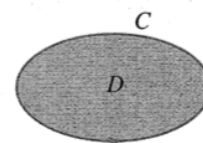
Fundamental Theorem of Calculus $\int_a^b F'(x) dx = F(b) - F(a)$



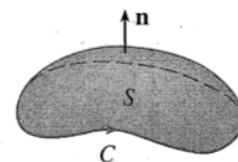
Fundamental Theorem for Line Integrals $\int_C \nabla f \cdot d\mathbf{r} = f(\mathbf{r}(b)) - f(\mathbf{r}(a))$



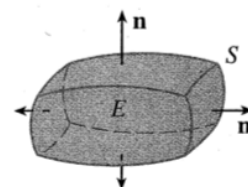
Green's Theorem $\iint_D \left(\frac{\partial Q}{\partial x} - \frac{\partial P}{\partial y} \right) dA = \int_C P dx + Q dy$



Stokes' Theorem $\iint_S \text{curl } \mathbf{F} \cdot d\mathbf{S} = \int_C \mathbf{F} \cdot d\mathbf{r}$



Divergence Theorem $\iiint_E \text{div } \mathbf{F} dV = \iint_S \mathbf{F} \cdot d\mathbf{S}$



Some Advice

1. Look over your old exams.

You should know how to do anything that you didn't know how to do at the time. I've posted the exams (in case you have lost yours) with solutions.

2. Be extra sure to show your work.

Most of you will never come to see these exams, and I won't be tracking you down to ask questions, so make sure your work is clear.

3. Always tell me as much as you know.

If you get stuck, tell me as much as you know. Write a few sentences about what you would do if you remembered the thing you forgot. If you get an answer that can't possibly be correct, be sure to tell me that, even if you don't know how (or don't have time) to fix the problem.