Ma 2420011: Final Examination Instructions and Study Guide:

The final exam falls into three distinct sections. All of these must be completed by May 8th. If I do not receive all the parts then a zero will be assigned for the missing part. The test breaks down as follows, you can expect that the gradebook will record the Take Home portion separately from the In-class portion. There will be 102 possible points weighted by 100 points. You'll need to add the Take Home and the In-class to get your score.

	Points	Comments
Take Home	30pts	Can work with others, but turn in a solution of your own.
In-class, closed notes/book	20pts	Do your own work, only have what you remember from studying Will have a maximum of one hour to complete
In-class, open notes/book	50pts	Work on your own, but have notes/book (no calculator), again present complete solution. Will have about 2 hours to complete (probably will only take1 hour If you know what you're doing going into the test)

Of course you are free to ask me questions about the take home exam, but I may not give you the most efficient advice. I will tell you this much, there is an easy way to do certain problems on the Take Home and there is a hard way. You are not allowed to use Maple to simplify ugly integrals, you must do them as if it was after the robot holocaust so all the computers are evil.

In-class, closed notes/book:

PROBLEM ONE: (10pts) to be announced, I'll send an email out later warning of this. It may involve material from test III.

PROBLEM TWO: (5pts) a conceptual question about conservative vectors fields.

PROBLEM THREE: (15pts) Given the following,

$$e_r = \cos(\theta)\hat{i} + \sin(\theta)\hat{j} \qquad e_\theta = -\sin(\theta)\hat{i} + \cos(\theta)\hat{j}$$

Show that the gradient of a function in two variables is as follows in polar coordinates is,

$$\nabla f = \frac{\partial f}{\partial r} e_r + \frac{1}{r}\frac{\partial f}{\partial \theta} e_\theta$$

You need to show all the details. I would work this out before the test to be safe. Keep in mind that you will have one hour to complete the closed-book portion of the test. If you finish early you can start the open-book in-class part.

In-class, open notes/book:

There are 50 required points here and a possibility of 2 bonus points.

PROBLEM FOUR: (10pts) a problem that involves the Fundamental Theorem of Calculus(FTC) for line integrals. See page 395. Also homeworks from 13.2-13.3, especially 13.3. (H94-H99)

PROBLEM FIVE: (15pts) find the surface integral of some vector field through some surface. See pages 407-411. Also see homeworks from 13.6 especially those on H108-H110.

PROBLEM SIX: (15pts) a problem like E171 on pg. 418.

PROBLEM SEVEN: (4pts) a conceptual question. It will be easy if you have paid close attention to the lecture. It will come From the part of the notes which I have covered in lecture.

PROBLEM EIGHT: (4pts) an application of the Divergence Theorem. See pages 421-422 (E172,E173).

PROBLEM NINE: (4pts) Greene's Theorem trick problem like pages 413 (E166,E167,E168)

COMMENTS: I have designed several of these problems so that they are very simple if you understand the Theorems in Chapter 13. It is crucial that you come to an understanding of the FTC, Greene's, Stokes' and the Divergence Theorems. You will need to be confident in your ability to set up line and surface integrals, this means you should do all the homework that was required so that you are comfortable with parametrized surfaces and paths.