MATH 264 (Advanced Calculus), Winter 2006, McGill University
Monday Tutorial (Mondays at 1:35 in MD279)
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**ASSIGNMENT 3 GRADING SCHEME AND MARKER'S COMMENTS (VERSION 1)**

Below is a breakdown of how Assignment 3 was graded as well as some comments you may find useful.

General (20 marks)

- ✓ **[10 points] Submitting the assignment** Even a piece of paper with your name on it would be enough, although most everyone submitted complete assignments…
- ✓ **[10 points] (P, Presentation) Overall presentation** This was an assessment of the overall presentation and clarity of your assignment; some factors considered include:
  - Were the solutions neat and easy to read?
  - Did the solutions flow logically? Did one step follow clearly from the next, and was it clear where each step fit in the overall solution?
  - Were key steps explained using words? (i.e. not just thowing out equations; a couple of sentences per problem always helps to show you know what you're doing)
  - Were sketches drawn when appropriate?

  Most students got around 8-9 for this, and no one below 7; assignments with excellent, above-average effort put into the write-up got full marks for this component.
- ✓ **Plagiarism** An automatic score of zero was given for the entire assignment if obvious plagiarism was detected. Only 7 students got penalized this way, but it's still 7 too many. It's OK and encouraged to work in groups and we do expect similar solutions (there aren't a million ways to solve these problems), but at least understand what you're doing. Don't blindly copy, it's more obvious than you think!

Problem #1 (15 marks, multiplied by 2 in computing overall grade)

- ✓ **[5 points] (T, Try) Serious solution attempt made** (The vast majority got full marks easily for this)
- ✓ **[2 points] (A, Answer) Numerical answer** Correctness of final numerical answer; no partial marks. Always check your answers with others! (It surprised me how many people didn't)
- ✓ **[8 points] (S, Steps) Solution steps**
  - Algebraic errors (e.g. in computing the integral): -1 or -2
  - Errors in parametrization: -3 or -4
  - Adding the bottom half of the cone (which is outside the sphere): -2

Problem #2 (10 marks)

- ✓ **[7 points] (T, Try) Serious solution attempt made** (The vast majority got full marks easily for this)
- ✓ **[3 points] (A, Answer) Numerical answer** Correctness of final numerical answer; no partial marks.

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Problem #3 (20 marks)

- ✓ **[7 points] (T, Try) Serious solution attempt made** (The vast majority got full marks easily for this)
- ✓ **[3 points] (A, Answer) Numerical answer** Correctness of final numerical answer; no partial marks. Unfortunately, the sign also had to be correct; many of you didn't get the 3 points because the sign of the normal was wrong, which meant the answer's sign was wrong also (see the point below).
- ✓ **[10 points] (S, Steps) Solution steps**
  - Including the caps of the cone (the question doesn't ask for these; only the cone's wall was needed!): -2
  - Applying the divergence theorem without computing the flux through the caps of the cone (the cone itself isn't a closed surface, so you have to subtract flux through the parts that do close it if you're going to use this approach): -3
  - Wrong sign for the normal vector (had to point outward; LOADS of people made this mistake): -1

Problem #4 (0 marks)

This problem wasn't graded, but do check your answers with the official solutions! (it's a good problem also)

Problem #5 (20 marks)

- ✓ **[7 points] (T, Try) Serious solution attempt made** (The vast majority got full marks easily for this)
- ✓ **[3 points] (A, Answer) Numerical answer** Correctness of final numerical answer; no partial marks. Most people got the answer right in spite of including the caps of the cylinder, because it so happens that the fluxes exactly cancel out between the two caps; see the point further below.
- ✓ **[10 points] (S, Steps) Solution steps**
  - Including the caps of the cylinder, even if the net flux through them was found to be zero and didn't change the answer (again, the question doesn't ask for these): -2
  - Applying the divergence theorem without computing the flux through the caps of the cylinder (as in Problem #3, the cylinder itself isn't a closed surface, so you have to subtract flux through the parts that do close it if you're going to use this approach): -3

Overall mark (out of 100)

The overall mark was computed by multiplying the marks assigned to Problem #1 by 2 (effectively making it worth 30 marks total) and adding all the points together.