School of Mathematics – Homework Feedback Form

Unit: Multivariable Calculus	Week/Problem Sheet: 4
Lecturer: Richard Porter	Set questions: 1, 6
Marker: Zohar Neu	

General Comments

Overall the sheet was completed very well, with some minor mistakes in calculation leading to incorrect answers.
More fundamental issues of theory to consider are: how to properly parametarise functions for a given geometry (which in this case was an intersection of two simpler geometries).

Please list and comment on those aspects which students found easy:

Please list and comment on those aspects which students found hard:

Please provide detailed feedback below, using a separate box for each set question, indicating:

- **Parts that most students were able to complete correctly.**
- **Parts that some students were able to complete correctly but some students found difficult, with a further indication of where they might find an outline of the correct method of solution.**
- **Parts that many students were unable to complete correctly and any general reasons why they all went wrong.**

Question 1

This question was completed well by most of the students. Some students used an incorrect definition of the length of a curve, calculating this as $\int \mathbf{p}'(t)dt$ instead of $\int |\mathbf{p}'(t)|dt$, leading to incorrect answers.

Some students did not know how to integrate $\sqrt{(2-2\cos(t))}$. Even when the appropriate double angle formula needed to do this was identified, some mistakes came from incorrect integration of $\int \sin(t/2)dt$, forgetting to divide by a factor of ½ (essentially the reverse of the chain rule).

Question 6

a) Overall fairly well done. Sometimes students had trouble parametarising **F** correctly for the given geometry.

b) This question presented the most trouble out of the set questions. Some were uncertain of how to use Stoke's Theorem in this context.

A surprisingly common mistake was to incorrectly take the cross product when finding **N**, where the 'middle' minus sign, for the **y** co-ordinate of the resultant vector, was omitted in the calculation.