

School of Mathematics – Homework Feedback Form

Unit: Advanced Quantum Theory	Problem Sheet: 6
Lecturer: Sebastian Müller	Set questions: 2,5
Marker: Sebastian Müller	

General Comments

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

Question 2 and 5b, general ideas in the rest

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

See below

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 2: often done very well

Question 5a:

Some problems with number of variables (there are nN pairs of variables parametrised by single particle state e.g. site, and by the discretisation step in time)

Some problems with the coordinate transformation: The cleanest option is to just use real and imaginary parts of the components of a , then the Jacobian is very simple. Some students used the components of a and their complex conjugates instead in which case one would have to make the transformation using the determinant of a 2×2 Jacobian matrix.

Question 5b: done well

Question 5c: General idea spotted well, but sometimes technical steps in going to the continuum limit were not considered carefully and then one obtains a different result. In particular the K^2 from the matrix h is cancelled by going from the matrix to the second derivative but converting the sum to an integral brings in a factor K . (This factor would only be removed if one rescaled a .)