Homework assignment 5
Due October 6, either at the start of class or in my physics department mailbox at noon.

1. Do book problem 5.21

2. Do book problem 5.24

3. Do book problem 5.31

4. Do book problem 5.34

5. Do book problem 5.50

6. Do book problem 5.60

7. Applying an operator to a wave function is a means of computing the expectation value for the quantity represented by the operator – i.e. it tells something about what happens when the quantity is measured. From the Heisenberg uncertainty principle, we have seen that we cannot make infinitessimally precise measurements of certain quantities at the same time. Operators are said to commute if $\hat{A}\hat{B} - \hat{B}\hat{A}$ equals zero – i.e. that the combination of operators gives the same answer regardless of the order of the operations. Commuting operators are ones for which the measurement of one quantity doesn't affect the expectation value of the other. Show that some combinations of operators for which the uncertainty principle does apply are non-commuting operators.