

Problem Set 1
P511—Quantum Mechanics, Fall 2008
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Due Thursday, September 11

- 1.) Sakurai, problem 1.1
- 2.) Sakurai, problem 1.2
- 3.) Sakurai, problem 1.3
- 4.) (a) If A and B are Hermitian operators, which of the following four operators is Hermitian? (Make sure to explain your reasoning.)
 - 1) A^2
 - 2) $[A, B]$
 - 3) $\{A, B\}$
 - 4) $i[A, B]$
 - 5) A^2B^2
- (b) If C is not Hermitian, is the product $C^\dagger C$ Hermitian?
- 5.) A Hermitian operator has the property $X^\dagger = X$, whereas an anti-Hermitian operator obeys $X^\dagger = -X$.

Show that any operator Y may be expressed as the sum of a Hermitian operator and an anti-Hermitian operator.