



Quantum Computing: Assignment 1 – Linear Algebra & Foundations of Quantum Mechanics

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1 ADJOINT OPERATORS – SHEET ONE, QUESTION 4

Consider a finite-dimensional vector space V equipped with an inner product (\cdot, \cdot) . Suppose A and B are operators in V . Show the following identities

- (a) $(A^\dagger)^\dagger = A$.
- (b) $(AB)^\dagger = B^\dagger A^\dagger$.
- (c) If A and B are both Hermitian operators then the commutator $C = [A, B]$ is anti-Hermitian i.e. $C^\dagger = -C$.

1.1 SOLUTION – ADJOINT OPERATORS: SHEET ONE, QUESTION 4

Write your solution here

2 PROJECTION OPERATORS – SHEET ONE, QUESTION 5

Type the question here

2.1 SOLUTION – PROJECTION OPERATORS: SHEET ONE, QUESTION 5

Write your solution here

3 MEASUREMENTS AND EXPECTATION VALUES – SHEET TWO, QUESTION 1

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3.1 SOLUTION – PROJECTION OPERATORS: SHEET TWO, QUESTION 1

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4 SUBSPACES OF A VECTOR SPACE – SHEET TWO, QUESTION 3

Type the question here

4.1 SOLUTION – SUBSPACES OF A VECTOR SPACE: SHEET TWO, QUESTION 3

Write your solution here