Recitation #2
Quantum 521

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1. Prove that the eigenvectors of a Hermitian operator are orthogonal.

2. Consider an operator that is a function of the momentum operator $F(\hat{p})$. Prove

$$[x, F] = i\hbar \frac{dF}{d\hat{p}}$$

3. For a free particle find

$$\frac{d\langle x \rangle}{dt}$$

using the commutator $[x, p]$.