

Quantum Mechanics I, Problem Set 12

Due Wednesday December 7 in class

1. Townsend Chapter 7, Problem 2
2. Townsend Chapter 7, Problem 6
3. Townsend Chapter 7, Problem 8
4. Townsend Chapter 7, Problem 9
5. Show that in a coherent state $|\alpha\rangle$, the uncertainty in energy is given by $\Delta E = |\alpha|\hbar\omega$. Use your result to show that the fractional uncertainty $\Delta E / E$ vanishes as $|\alpha| \rightarrow \infty$, as is appropriate for the classical limit.
6. Griffith Chapter 8, Problem 3.
7. Use the WKB approximation to find the allowed energies of the potential $V(x) = \alpha x^4$