PHYS 4210 : QM

Fall 2024

Homework 1

Notes : 1. Due date : Sept 2, 2024, By 11:59 PM

2. Textbook : Intro. to Quantum Mech, 3rd ed., Griffiths

3. All questions are worth 20 marks

1. Problem 1.5 from textbook
2. Problem 1.9 from textbook
3. Problem 1.16 from textbook
4. For the following wave function, verify that the uncertainty principle holds:

$$\psi(x,t) = \frac{1}{\sqrt{2}}\psi_1(x)\, e^{-iE_1 t/\hbar} + \frac{i}{\sqrt{2}}\psi_2(x)\, e^{-iE_2 t/\hbar}$$

5. For a given wave function

$$\psi(x) = A\, e^{ikx} \cos\left(\frac{3\pi x}{L}\right) \quad \text{for } -L/2 \le x \le L/2$$

$$= 0 \quad \text{elsewhere}$$

Find A. What is the probability of finding the particle in the region $0 \le x \le L/4$