PHYS 451 Quantum Mechanics I (Spring 2018)
Quiz #2

Consider a particle of mass m in an infinite square well $(0 \leq x \leq a)$. The initial state of the particle (at $t = 0$) is given by

$$\Psi(x, 0) = A\big[\psi_1(x) - 2\psi_2(x) + i\psi_3(x)\big],$$

where ψ_k are the energy eigenstates, and A is a constant.

1. Normalize the wave function.

2. What are the possible outcomes of a measurement of the energy, and with what probabilities would they occur?

3. What is the average value of the energy?

4. What is the wave function of the particle at some later time $t > 0$?