Hand in at beginning of next lecture

Problem 1. In classical mechanics we study how positions or momenta evolve. What do we study in quantum mechanics

Solution 1.1.

Problem 2. Measurement

2.1. If I know the wavefunction, do I know for certain where a particle is? Y N
2.2. Do I know for certain the particle must be somewhere? Y N
2.3. If I measure in quick succession, will I find the particle in the same place each time? Y N
2.4. What is the probability that I find the particle at position x?

Solution 2.4.

Problem 3. Dynamics

What are the rules by which the wavefunction evolves in time?

Solution 3.1.

Bored? Try the problem on the back
Problem 4. Bonus problem
What is the physical meaning of each of the following:

4.1. The absolute value $|\psi(x)|$

Solution 4.1.

4.2. The complex phase $\phi(x) = \arg \psi(x)$

Solution 4.2.

4.3. The gradient of the phase $\nabla \phi(x)$

Solution 4.3.

4.4. The real part of $\psi(x)$

Solution 4.4.