PHYS 360: Quantum Mechanics NAME:_____

Reading Quiz

Date 9/12/8

Reading: Griffiths, pages 1-59

1) John Bell astonished the physics community by showing that it makes an *observable* difference whether the particle had a precise (though unknown) position prior to the measurement, or not.

Circle One:

a) Griffiths lays out the proof of Bell's story in the first chapter of the book.
b) Griffiths mentions Bell's discovery, but refers the full story to the end of the book
c) Griffiths never mentions Bell in the first chapter
d) Griffiths claims Bell argues that physicist should "refuse to answer" any questions that cannot be tested.

2) Schrödinger equation: $$i\hbar\frac{\partial\Psi}{\partial t}=-\frac{\hbar^2}{2m}\frac{\partial^2\Psi}{\partial x^2}+V\Psi$$

Work out $\frac{\partial}{\partial t}\left(\Psi^*\Psi\right)$ and circle the correct answer.

a) $$\frac{\partial}{\partial t}\left(\Psi^*\Psi\right)=\frac{i\hbar}{2m}\left(\Psi^*\frac{\partial^2\Psi}{\partial x^2}+V\Psi\right)$$

b) $$\frac{\partial}{\partial t}\left(\Psi^*\Psi\right)=\frac{i\hbar}{2m}\left(\Psi^*\frac{\partial^2\Psi}{\partial x^2}-V\Psi\right)$$

c) $$\frac{\partial}{\partial t}\left(\Psi^*\Psi\right)=\frac{i\hbar}{2m}\left(\Psi^*\frac{\partial^2\Psi}{\partial t^2}-\frac{\partial^2\Psi^*}{\partial t^2}\Psi\right)$$

d) $$\frac{\partial}{\partial t}\left(\Psi^*\Psi\right)=\frac{i\hbar}{2m}\left(\Psi^*\frac{\partial^2\Psi}{\partial x^2}-\frac{\partial^2\Psi^*}{\partial x^2}\Psi\right)$$

e) $$\frac{\partial}{\partial t}\left(\Psi^*\Psi\right)=\frac{i\hbar}{2m}\left(\Psi^*\frac{\partial\Psi}{\partial x}-\frac{\partial\Psi^*}{\partial x}\Psi\right)$$