

## PHYS 451 Quantum Mechanics II (Fall 2017)

Schrödinger's  
Pumpkin

## Spooky Quiz #5

Schrödinger's  
Cat

1. (20%) True or false:
  - (a) Every linear combination of solutions of the stationary Schrödinger equation is a solution of this equation
  - (b) Every linear combination of solutions of the time-dependent Schrödinger equation is a solution of this equation
2. (80%) Consider a particle of mass  $m$  in an infinite square well,  $0 \leq x \leq a$ . At  $t = -\infty$  the particle is in the ground state. It is then subjected to a time-dependent perturbation in the form

$$H' = V_0 e^{-t^2/\tau^2},$$

where  $V_0$  and  $\tau$  are some constants. What is the probability that the particle is found in the first excited state at  $t = +\infty$ ?