

LATE HOMEWORK INCURS -10%/WEEKDAY LATE, UP TO 50% MAXIMUM

The purpose of this homework set is to make sure you are familiar with the basic “tools” of quantum mechanics. For this first homework set, **and only this homework set**, you are allowed to use the results found in Griffiths, including the solutions. However, I *strongly* urge you to do the work yourself and do not copy Griffiths’ work word for word or equation by equation. You must do all the work of each problem yourself, in your own handwriting (or, better yet, using your own *Mathematica* code – extra 10% bonus credit for plotting all plots using *Mathematica*).

1 Griffiths Example 2.1 : Plot $|\Psi(x, t)|^2$ assuming $E_2 = 10$ eV and $E_1 = 1$ eV and $c_1 = c_2 = \sqrt{1/2}$. Use eigenvectors appropriate for the infinite square well, harmonic oscillator and plane waves (unbound wave function).

2 Griffiths Example 2.2 : Plot $\Psi(x, t)$ using terms up to $n = 5$.

3 Griffiths Example 2.3

4 Griffiths Example 2.4 : Plot $\Psi(x, t)$ assuming $\omega = 2\pi/sec$ and $m = 1kg$. For $\Psi(x, t)$ use harmonic oscillator wave functions – Any linear combination you prefer.

5 Griffiths Example 2.5

6 Griffiths Example 2.6 : Plot $|\Psi(x, t)|^2$ – do the integral in Eq. 2.104 numerically – assuming $a = 1 \times 10^{-10}m$.