ECE 462 - Homework #2

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1 Problem 2.1.1

$$E_{a=100} = 3.75meV$$

$$E_{a=10} = \frac{3.75}{(\frac{1}{10})^2} = n^2 \cdot 375meV$$

2 Problem 2.1.2

For the purposes of this simulation, the answers would not really be different. For a particle whose energy is approximately 0.3eV, 3eV is two orders of magnitude higher - and thus practically infinite.

2.1 Problem 2.1.4

All of the energy of the particle in the well is kinetic, thus the energy is:

$$KE = E|_{n=1} = 375meV$$

3 Problem 2.1.5

The solution for A in Equation 2.8 is:

$$A = \pm\sqrt{\frac{2}{a}}, \text{ or } \pm i\sqrt{\frac{2}{a}}$$

4 Problem 2.2.2

$$\psi_n(x) = \sum_{n=1}^{N} \varepsilon_n \cdot \phi_n$$