1. Consider the double delta-function potential

\[ V(x) = -\frac{\hbar^2}{ma} \left( \delta(x + a/2) + \delta(x - a/2) \right), \]

where \( a \) is a positive constant with units of length.

a) Find the expressions which determine the energy and (unnormalized) wavefunctions of the lowest-energy bound state. Calculate the energy if \( a=1\text{nm} \).

b) Use a suitable approximation to numerically calculate the energy and wavefunction corresponding to the potential above with MATLAB/Octave for \( a=1\text{nm} \). Directly compare the calculated electron density and energy to your analytical result.

**ALSO:** Griffiths 2\textsuperscript{nd} ed, problems 2.24, 2.25, and 2.39