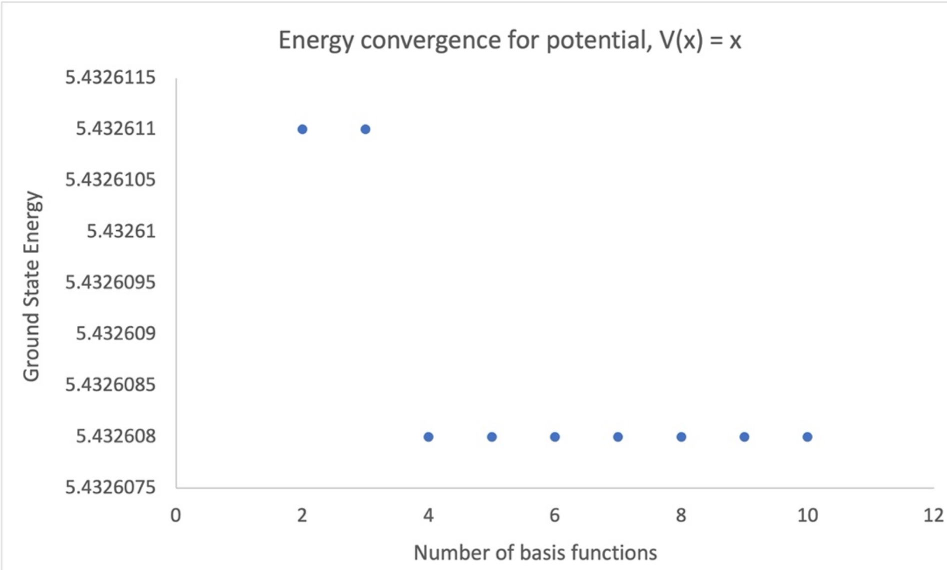
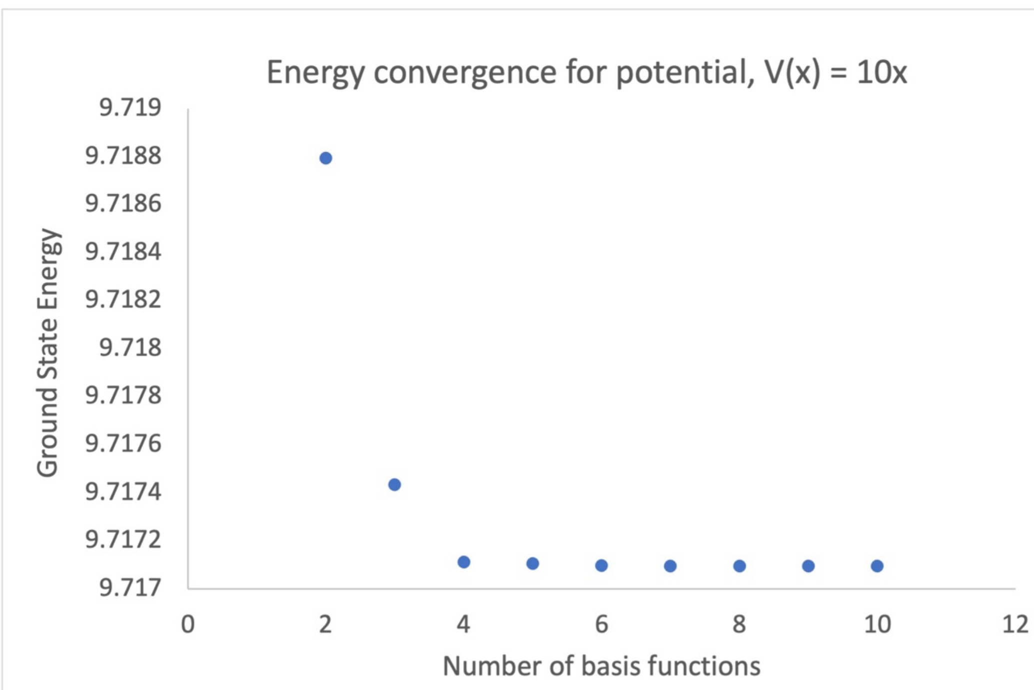
Program 5 - Slanted Potential, V(x) = bx, for PIB

Figure 1: Energy convergence for V(x) = x



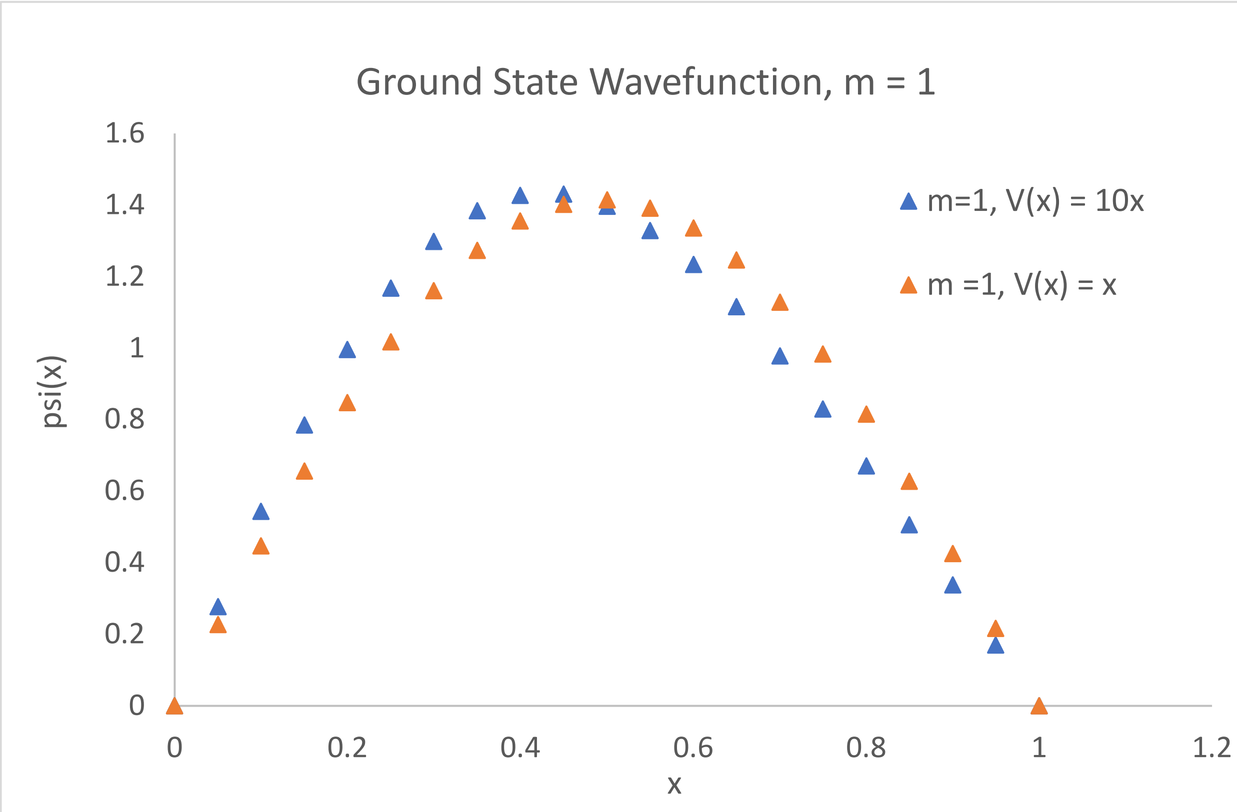
Energy converges to the 6^{th} decimal place at 4 basis functions, therefore N = 4 was used to plot the wavefunction for the potential, V(x) = x.

Figure 2: Energy convergence for V(x) = 10x



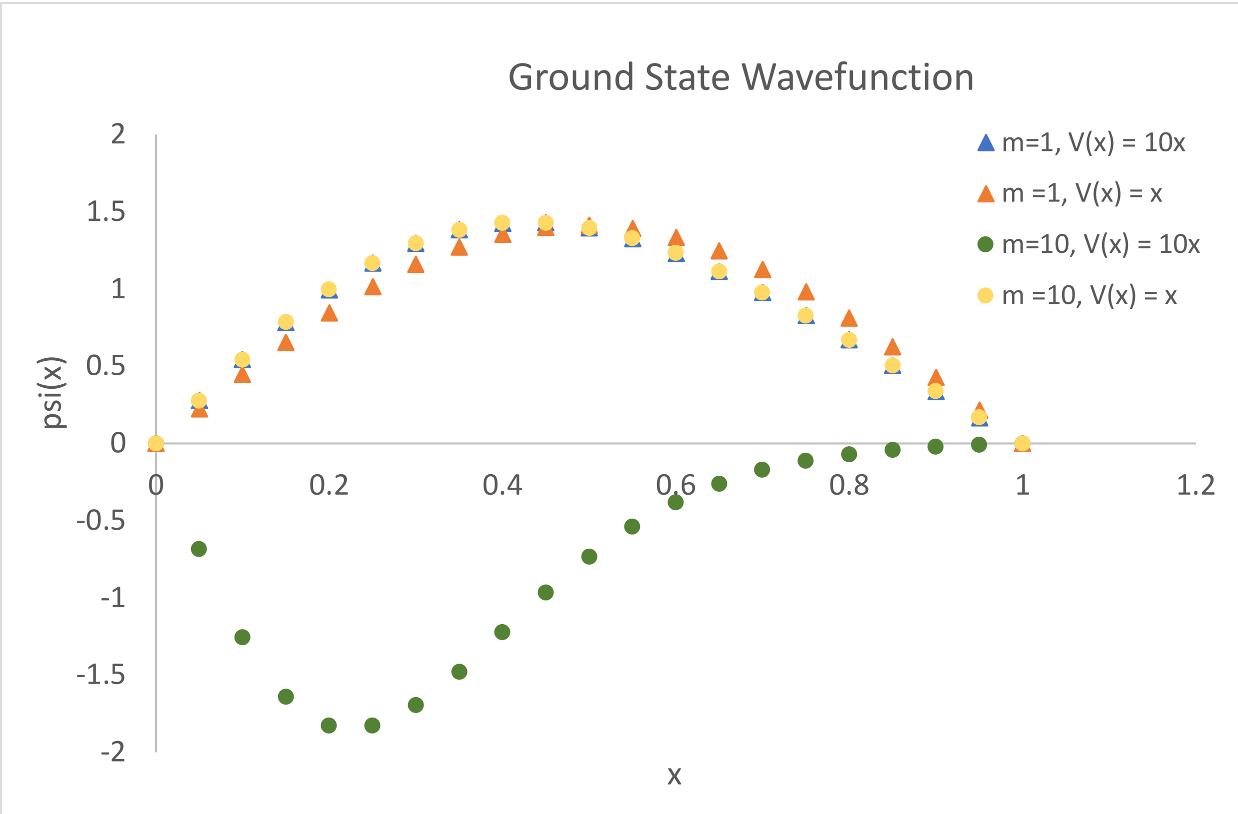
Energy converges to the 6^{th} decimal place at 8 basis functions, therefore N = 8 was used to plot the wavefunction for the potential, V(x) = 10x.

<u>Figure 3:</u> Ground state wavefunction for mass = 1



The added potential shifts the ground state wavefunction to the left. For b = 10, the probability shifts to the left because the slope of the slanted potential is much steeper. For b = 1, the slope isn't as steep, so the probability is relatively uniform.

Figure 4: Ground state wavefunction for mass = 10 & mass = 1



Increasing the mass to m = 10 shifts the b = 1 plot to the left, and it now overlaps with the m=1, b= 10 wavefunction. The b = 10 wavefunction changed phase and asymptotically approaches zero as x approaches one.

Influence of the potential, for m = 10 and b = 10, leads to non-classical behavior as a result of the increased slope.