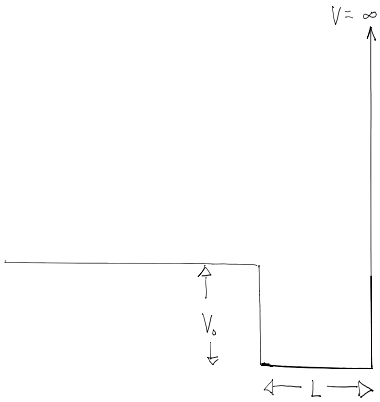
SP4.

Problem 3: 1-D Potential Scattering

For the potential shown below, we want to find the energy eigenfunctions which correspond to an incident flux coming from the left (with $E > V_0$) for a particle of mass m.



(a) Write down the wavefunction for all space. Feel free to choose a convenient coordinate system.

(b) Use the continuity conditions on the wavefunction to determine the coefficients in your wavefunction from part (a), and find the ratio of the reflected to incident amplitude for $x \to -\infty$.
What is the reflection coefficient?

(c) What is the phase shift of the reflected amplitude with respect to the incident amplitude?