

Physics 267: Problem #14

A step potential is defined to have $U(x) = 0$ for $x < 0$ and $U(x) = U_0$ for $x \geq 0$. A particle traveling in the positive x -direction is described by a free particle wave function $\psi(x) = Ae^{ikx}$ and has $E < U_0$. Show that such particles are always reflected from the barrier. Hint: show that $\frac{|B|^2}{|A|^2} = 1$ where B is the coefficient in the wave function describing the reflected particles.