Assignment 4

1. Give a rigorous mathematical proof that "$H(x) = K(t)$ for all pairs of real numbers (x, t)" implies that "$H(x)$ and $K(t)$ are constant".

2. Given a potential $V(x)$ with the following profile

$$V(x) = \begin{cases} 0 & x < 0 \\ V_0 & x > 0 \end{cases}$$

   solve the Time-Independent Schrödinger Equation for the case where $E < V_0$. In fact, we have already solved this problem in the class. I just want you to review the procedure.

3. Show that we have a total reflection in 2 above. This amounts to computing the reflection coefficient and showing it is 1.