Quiz #6 (Particles and Barriers)

Prob. 1(2)

Expand a constant A with the basis function $\sqrt{2/L}\sin(\frac{n\pi}{L})$ with integer n for

$0 \leq x \leq L$. In other words, determine a_n when $A = \sum_{n=1}^{\infty} a_n \sqrt{2/L}\sin(\frac{n\pi}{L})$ for $0 \leq x \leq L$.

Prob. 2(3)

A quantum mechanical particle with mass m and kinetic energy E is injected from left (V(x)=0 for x<0) into a potential barrier (V(x)= V_0 < E for x<0) at x = 0.

Show that the reflection coefficient for this particle is given as $\dfrac{\sqrt{E}-\sqrt{E-V_0}}{\sqrt{E}+\sqrt{E-V_0}}$.

Prob. 3(1)

What is the EM wave phenomenon which is mathematically analogous to the quantum mechanical tunneling due to the infinitely thick potential barrier?