

HW ch 5 #32

6/16, 19, 23

5-32

$$E < U_0$$

$$\psi_0 = A \sin k_0 x + B \cos k_0 x \quad k_0 = \sqrt{\frac{2mE}{\hbar^2}}$$

$$\psi_1 = C e^{k_1 x} + D e^{-k_1 x} \quad k_1 = \sqrt{\frac{2m}{\hbar^2}(U_0 - E)}$$

$C = 0$ by requirement
that $\psi_1(\infty) < \infty$

B.C. at $x = 0$

Continuity of ψ

$$\cancel{A \sin k_0 x} \quad B = D$$

Continuity of ψ'

$$k_0 A \cos k_0 x = k_0 A = -k_1 D e^{-k_1 x} = -k_1 D$$

$$D = -\frac{k_0}{k_1} A$$