$$p(x) = \sqrt{2m[E - V(x)]} \tag{9.2}$$

$$T \approx e^{-2\gamma}, \quad \gamma = \frac{1}{\hbar}\int_0^a |p(x)|\,dx \tag{9.23}$$

Let

$$p(x) = i\sqrt{2m(V_0 - E)}, \quad |p(x)| = \sqrt{2m(V_0 - E)}$$

We have

$$\gamma = \frac{1}{\hbar}\int_{-a}^{a} \sqrt{2m(V_0 - E)}\,dx = \frac{2a}{\hbar}\sqrt{2m(V_0 - E)}$$

Hence

$$T^{-1} \approx \exp\left(\frac{4a}{\hbar}\sqrt{2m(V_0 - E)}\right) \tag{1}$$

This is the exact result from problem 2.33.

$$T^{-1} = 1 + \frac{V_0^2}{4E(V_0 - E)}\sinh^2\left(\frac{2a}{\hbar}\sqrt{2m(V_0 - E)}\right)$$

Note that

$$\sinh^2\left(\frac{2a}{\hbar}\sqrt{2m(V_0 - E)}\right) = \frac{1}{4}\exp\left(\frac{4a}{\hbar}\sqrt{2m(V_0 - E)}\right) + \frac{1}{4}\exp\left(-\frac{4a}{\hbar}\sqrt{2m(V_0 - E)}\right) - \frac{1}{2}$$

Hence for $T \ll 1$ we have

$$T^{-1} \approx \frac{V_0^2}{16E(V_0 - E)}\exp\left(\frac{4a}{\hbar}\sqrt{2m(V_0 - E)}\right)$$