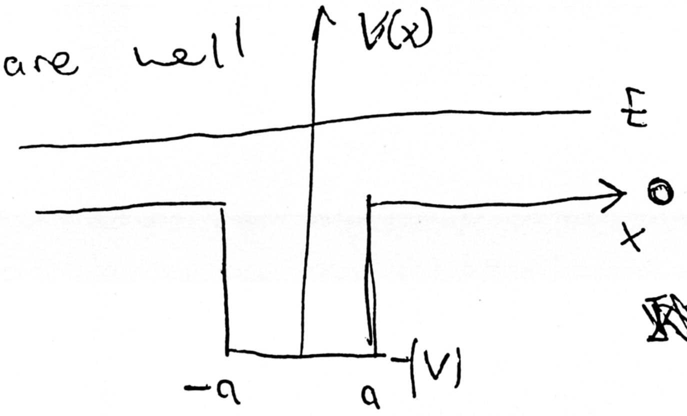
A square well



CUPS
eq 3.37
(for barrier, not well)

$$T = \frac{4k^2\underline{K}^2}{(k^2-\underline{K}^2)^2 \sinh^2 2\underline{K}a + 4k^2K^2\cosh^2 2Ka}$$

let $\boxed{K = i\,\underline{K}}$ $\boxed{\left(\underline{K} = \sqrt{\tfrac{2m}{\hbar^2}(E+|V|)}\right)}$ $\boxed{\left(\frac{k}{\underline{K}} + \frac{\underline{K}}{k}\right)^2 = \left(\frac{k}{\underline{K}} - \frac{\underline{K}}{k}\right)^2 + 4}$

$\boxed{\sinh ix = i \sin x}$

Eq 3.37 is for square barrier $E < V$
~~for~~ square well drawn above $E > V$ so
we find resonances in transmission.

$$T^{-1} = 1 + \left(\frac{k}{\underline{K}} - \frac{\underline{K}}{k}\right)^2 \frac{\sin^2 2\underline{K}a}{4}$$

$$\boxed{T^{-1} = 1 + \frac{1}{4}\frac{V^2}{E(E+|V|)}\sin^2(2\underline{K}a) \qquad \text{eq } 1}$$

- Transmission goes to 100% when $2\underline{K}a = n\pi$ (Ramsauer Effect)
- Convert eq. 3.37 into eq 1
- Plot T vs E/V for $\frac{2m(2a)^2V}{\hbar^2} = 10^5$ and 16 for the 1st four maxima of T.