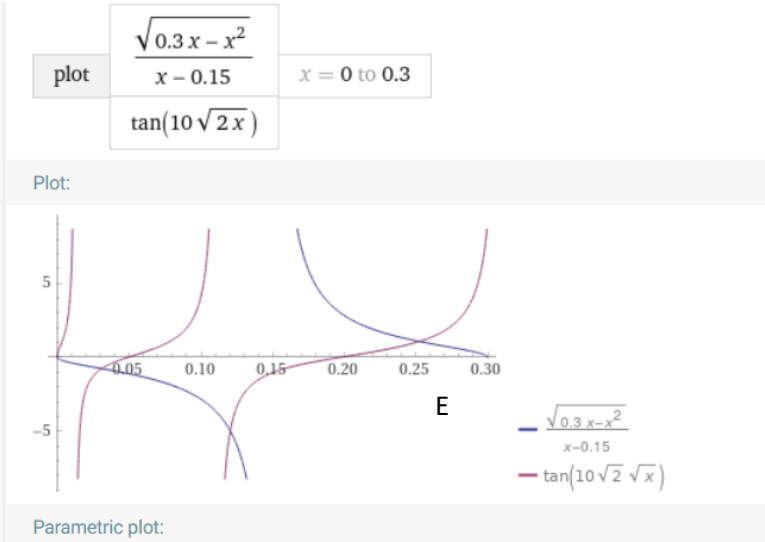
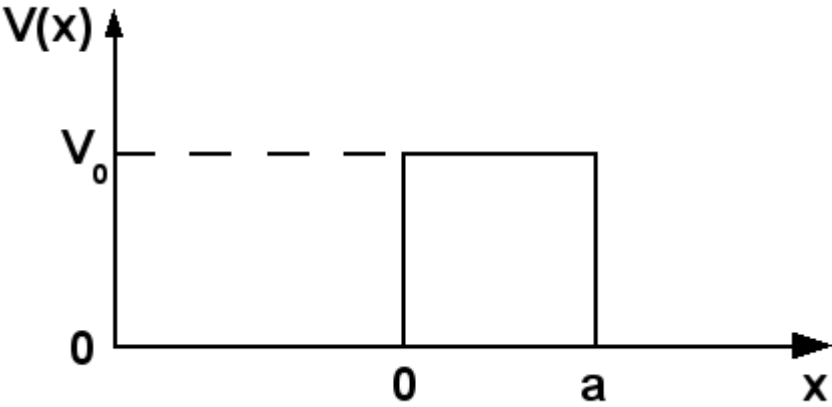
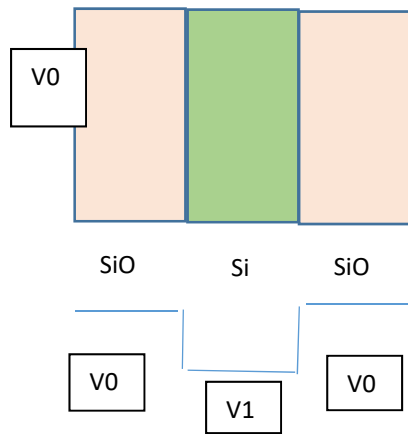
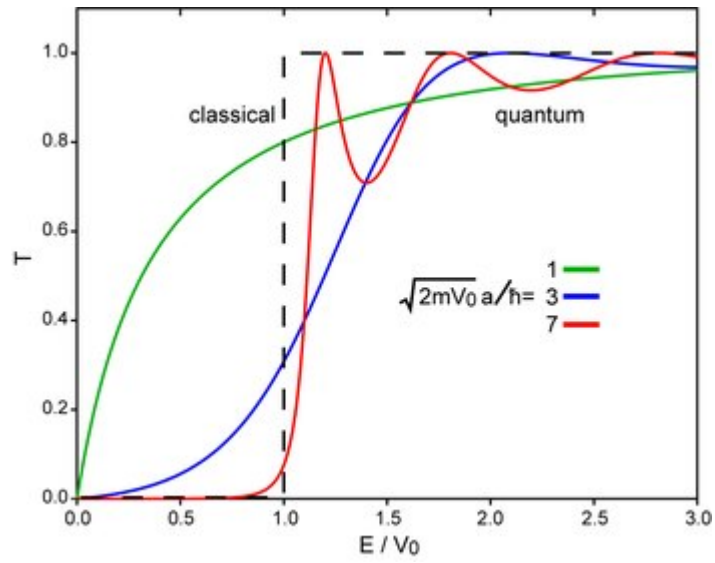


Electron in a finite box of length 10 a.u. (i.e., ~ 5 Å), with $V_0 = 0.3$ a.u. (i.e., ~ 9 eV)



Rectangular barrier (figures from Wikipedia)





Example of how one could make a potential trap from semiconductor materials

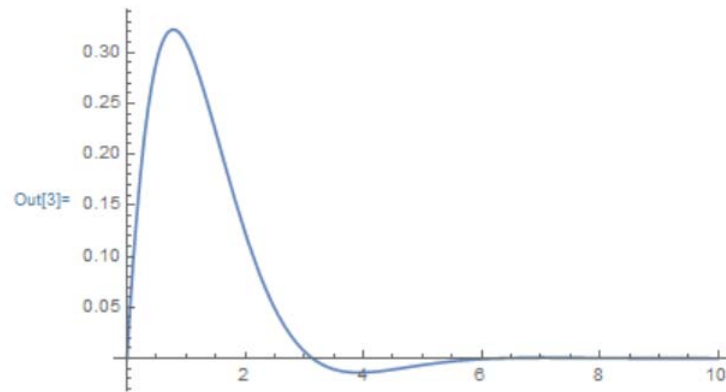
In[1]:= `FourierSinTransform[Sin [b t], t, ω]`

$$\text{Out[1]} = \sqrt{\frac{\pi}{2}} \text{DiracDelta}[-b + \omega] - \sqrt{\frac{\pi}{2}} \text{DiracDelta}[b + \omega]$$

In[2]:= `FourierSinTransform[Sin [b t] Exp[-t], t, ω]`

$$\text{Out[2]} = \frac{2 b \sqrt{\frac{2}{\pi}} \omega}{b^4 - 2 b^2 (-1 + \omega^2) + (1 + \omega^2)^2}$$

In[3]:= `Plot[Sin[t] Exp[-t], {t, 0, 10}]`



In[7]:= `Plot` $\left[\frac{2 \sqrt{\frac{2}{\pi}} \omega}{b^4 - 2 (-1 + \omega^2) + (1 + \omega^2)^2}, \{\omega, 0, 5\} \right]$

