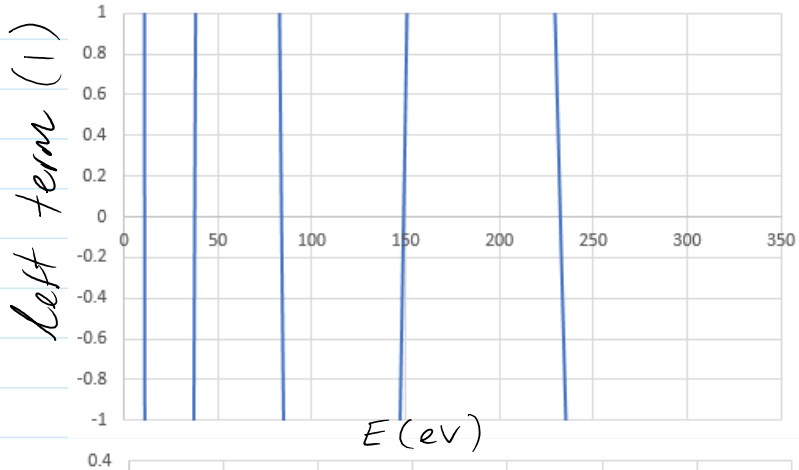
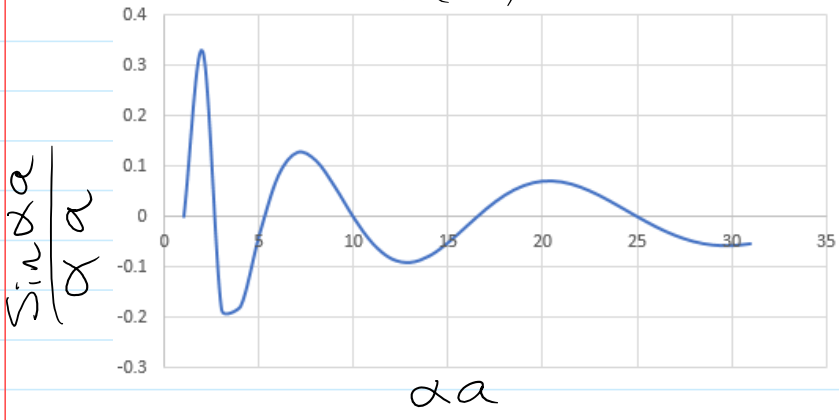
Preparation

i)



Approximate Allowed

$E_1 \approx 9eV$
$E_2 \approx 42eV$
$E_3 \approx 75eV$
$E_4 \approx 150eV$
$E_5 \approx 235eV$



- Graphs were attained by using an excel spreadsheet to evaluate

$$\left(\frac{mV_0ab}{\hbar^2}\right)\frac{\sin\alpha a}{\alpha a} + \cos\alpha a = \cos ka \qquad (eq\ 1)$$

where $V_0 = 300eV \cdot 1.602\times10^{-19}$
$m = m_e = 9.11\times10^{-31}$
$a = b = 0.2\times10^{-9}\,m$

$$\alpha = \frac{\sqrt{2mE}}{\hbar}$$

ii) Allowed energies of a single square well with the same dimensions

$E_1 = 7.59\ eV$
$E_2 = 30.28\ eV$
$E_3 = 67.8\ eV$
$E_4 = 119.56\ eV$
$E_5 = 184.33\ eV$
$E_6 = 258.57\ eV$

- In comparison to a single square well, the alloweed energies are further apart, and there are only five distint allowed energies