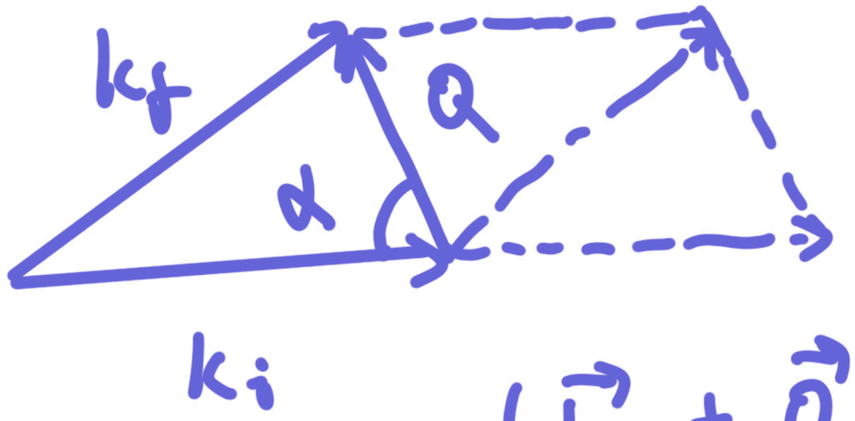

$$(\vec{k_i} + \vec{Q})^2 = \vec{k_f}^2$$

$$|\vec{k_i}|^2 + |\vec{Q}|^2 + 2|\vec{k_i}||\vec{Q}|\cos\alpha = |\vec{k_f}|^2$$

$$\cos\alpha = \frac{|\vec{k_i}|^2 + |\vec{Q}|^2 - |\vec{k_f}|^2}{2\cdot|\vec{k_i}|\cdot|\vec{Q}|}$$

$E_i = 20\,meV$

$k_i = k_f = 3.107\ A^{-1}$

test: $|\vec{Q}| = 3.107$ $\quad |\vec{Q}| = 2$

$\Downarrow$

$\alpha = 60°$ $\quad \alpha = \arccos\left(\frac{4}{4\times 3.107\times 2}\right) = 71.225°$