8 With respect to the origin O, the points A and B have position vectors $2\mathbf{i}+4\mathbf{k}$ and $5\mathbf{i}+\mathbf{j}+6\mathbf{k}$ respectively. The line l_1 passes through the points A and B.

(a) Find a vector equation for the line l_1. [2]

The line l_2 has equation $\mathbf{r} = 2\mathbf{i}+\mathbf{j}+5\mathbf{k}+\mu(\mathbf{i}+2\mathbf{j}+3\mathbf{k})$.

(b) Show that l_1 and l_2 do **not** intersect. [4]

(c) Find the acute angle between the directions of l_1 and l_2. [3]