

A-Level Mathematics: 9709 Mathematics June 2025 Question Paper 31

- 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]

This image shows a blank sheet of white paper with horizontal dotted lines. The lines are evenly spaced and run across the width of the page, providing a guide for handwriting or typing. There are no margins, text, or other markings on the page.

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]

This image shows a blank sheet of primary-ruled paper. It features ten horizontal dotted lines spaced evenly down the page. At the bottom center, there is a small circle containing the number "1". The rest of the page is white and contains no other markings or text.

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