4 The points A, B, C have position vectors

$$3\mathbf{i}+5\mathbf{j}+5\mathbf{k}, \qquad 2\mathbf{i}+2\mathbf{j}+2\mathbf{k}, \qquad 2\mathbf{i}+\mathbf{j}-\mathbf{k},$$

respectively, relative to the origin O.

(a) Find the equation of the plane ABC, giving your answer in the form $ax+by+cz=d$. [5]

(b) The point D has position vector $\mathbf{i}-\mathbf{j}+3\mathbf{k}$.

Find the shortest distance between the lines AB and CD. [5]