

4. Relative to a fixed origin O ,

the point A has position vector $\mathbf{i} + 7\mathbf{j} - 2\mathbf{k}$,

the point B has position vector $4\mathbf{i} + 3\mathbf{j} + 3\mathbf{k}$,

and the point C has position vector $2\mathbf{i} + 10\mathbf{j} + 9\mathbf{k}$.

Given that $ABCD$ is a parallelogram,

(a) find the position vector of point D .

(2)

The vector \vec{AX} has the same direction as \vec{AB} .

Given that $|\vec{AX}| = 10\sqrt{2}$,

(b) find the position vector of X .

(3)

(Total for Question 4 is 5 marks)