

4 It is given that $ABCD$ is a quadrilateral. The position vector of A is $\mathbf{i} + \mathbf{j}$, and the position vector of B is $3\mathbf{i} + 5\mathbf{j}$.

(a) Find the length AB . [1]

(b) The position vector of C is $p\mathbf{i} + p\mathbf{j}$ where p is a constant greater than 1.

Given that the length AB is equal to the length BC , determine the position vector of C . [3]

(c) The point M is the midpoint of AC .

Given that $\overrightarrow{MD} = 2\overrightarrow{BM}$, determine the position vector of D . [2]

(d) State the name of the quadrilateral $ABCD$, giving a reason for your answer. [2]