

- 4 The points A , B , C and D are the vertices of a quadrilateral $ABCD$ such that

$$\overrightarrow{AB} = 7\mathbf{i} + p\mathbf{j} \quad \overrightarrow{AC} = 11\mathbf{i} - p\mathbf{j} \quad \overrightarrow{AD} = 4\mathbf{i} - 2p\mathbf{j}$$

- (a) Show that, for all values of p , $ABCD$ is a parallelogram.

(3)

Given that $|\overrightarrow{BD}| = 3\sqrt{10}$

- (b) find the possible values of p .

(3)

Given that $p > 0$

- (c) find a unit vector which is parallel to \overrightarrow{BD} .

(1)

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Question 4 continued

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(Total for Question 4 is 7 marks)

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