8

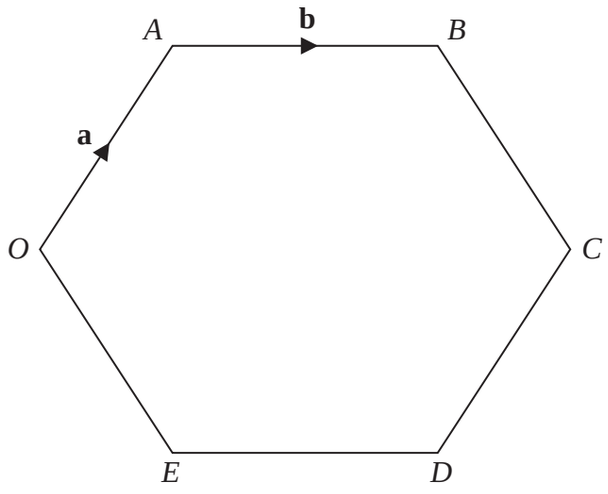

Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows the regular hexagon $OABCDE$ with $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{AB} = \mathbf{b}$

(a) Find $\overrightarrow{OB}$ in terms of **a** and **b**

(1)

(b) Find $\overrightarrow{BC}$ as a simplified expression in terms of **a** and **b**

(3)

The point M divides BC in the ratio $2:1$

(c) Find $\overrightarrow{OM}$ as a simplified expression in terms of **a** and **b**

(2)

The point Y is such that OMY and ABY are straight lines.

(d) Use a vector method to find $AB:BY$

(5)

The area of hexagon $OABCDE$ is $60\,\text{cm}^2$

(e) Find the area of triangle OAY

(4)

Question 8 continued

Question 8 continued

Question 8 continued

(Total for Question 8 is 15 marks)