9

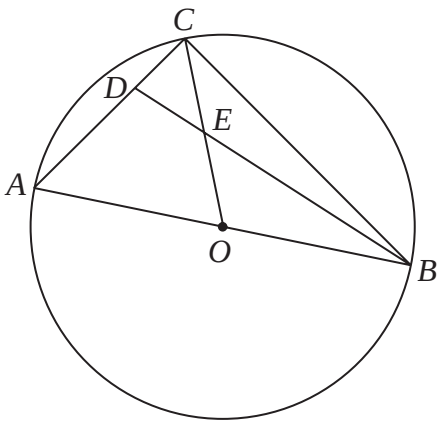

Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows three points *A*, *B* and *C* on a circle with centre *O* where *AOB* is a diameter of the circle.

D is the point on *AC* such that $AD : DC = 3 : 2$

Given that $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{AD} = \mathbf{b}$

(a) find, in terms of **a** or **b** or **a** and **b** where appropriate, a simplified expression for

(i) $\overrightarrow{AC}$ (ii) $\overrightarrow{CO}$ (iii) $\overrightarrow{DB}$

(4)

E is the point such that *CEO* and *DEB* are straight lines.

By considering both $\overrightarrow{AD} + \overrightarrow{DE}$ and $\overrightarrow{AC} + \overrightarrow{CE}$

(b) find a simplified expression for $\overrightarrow{AE}$ in terms of **a** and **b**

(5)

Given that $|\mathbf{a}| = 7\,\text{cm}$ and $|\mathbf{b}| = 6\,\text{cm}$,

(c) calculate the exact area, in cm^2, of ΔABC

(4)

Question 9 continued

Question 9 continued

Question 9 continued

(Total for Question 9 is 13 marks)