10

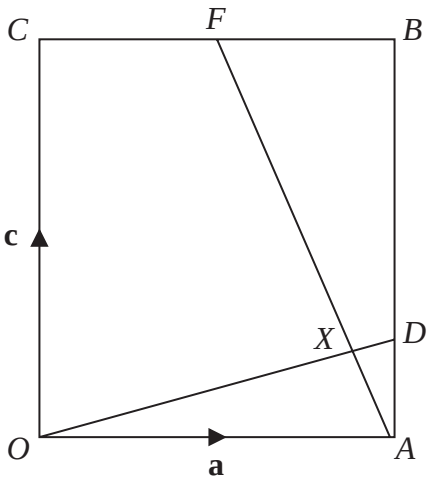

Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows a rectangle $OABC$ in which $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OC} = \mathbf{c}$

F is the midpoint of CB and D is the point on AB such that $AD : DB = 2 : 3$

(a) Find

(i) $\overrightarrow{CF}$ in terms of **a** (ii) $\overrightarrow{AD}$ in terms of **c**

(2)

The lines OD and AF intersect at the point X

Given that $\overrightarrow{OX} = \lambda\overrightarrow{OD}$ and $\overrightarrow{AX} = \mu\overrightarrow{AF}$, where λ and μ are scalars,

(b) find the value of λ and the value of μ

(7)

Given that $OX : XD = n : 1$

(c) find the value of n

(1)

Given also that $|\mathbf{a}| = 12\,\text{cm}$ and $|\mathbf{c}| = 12.5\,\text{cm}$,

(d) find the area, in cm^2, of quadrilateral $XDBF$

(4)

Question 10 continued

Question 10 continued

Question 10 continued

(Total for Question 10 is 14 marks)