Question 9 continued

(Total for Question 9 is 8 marks)

10

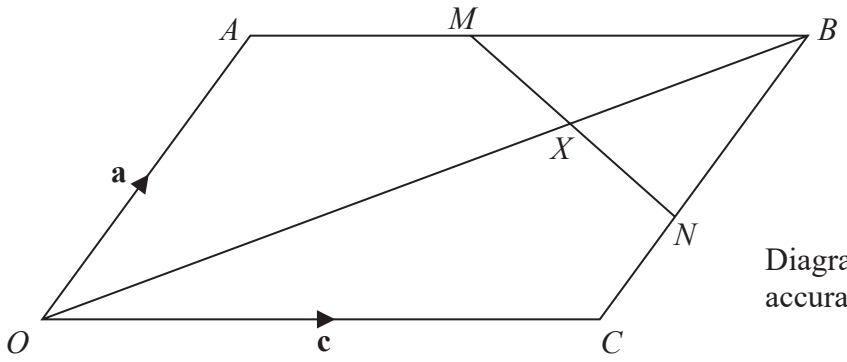

Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows the parallelogram $OABC$

$$\overrightarrow{OA} = \mathbf{a} \qquad \overrightarrow{OC} = \mathbf{c}$$

The midpoint of AB is M and the midpoint of BC is N.

The line OB intersects MN at the point X.

(a) Find in terms of **a** and **c**,

(i) $\overrightarrow{OB}$

(ii) $\overrightarrow{MN}$

(2)

Given $\overrightarrow{MX} = \lambda\overrightarrow{MN}$ and that $\overrightarrow{OX} = \mu\overrightarrow{OB}$,

(b) use a vector method to find the value of λ and the value of μ.

(8)

(c) Hence find, in its simplest form, the ratio

Area of quadrilateral $OXNC$: Area of parallelogram $OABC$.

(3)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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