9

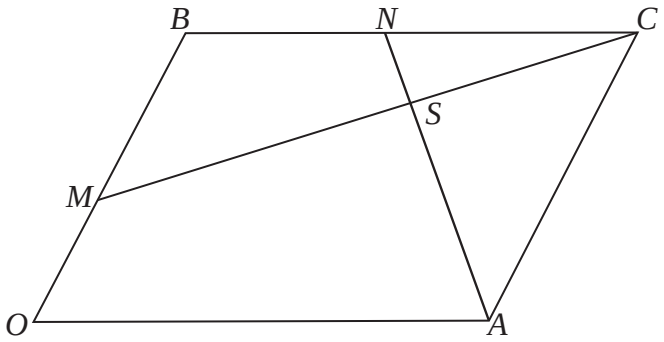

Diagram **NOT** accurately drawn

Figure 3

Figure 3 shows a parallelogram $OACB$ in which $\overrightarrow{OA} = 8\mathbf{a}$ and $\overrightarrow{OB} = 6\mathbf{b}$
The point M lies on OB such that $OM : MB = 1 : 2$
N is the midpoint of BC.

(a) Find, in terms of **a** or **b**, or **a** and **b**,

(i) $\overrightarrow{MB}$ (ii) $\overrightarrow{MC}$ (iii) $\overrightarrow{NA}$

(3)

The lines MC and AN intersect at the point S.

Given that $\overrightarrow{NS} = \lambda \overrightarrow{NA}$, where λ is a scalar,

(b) find, in terms of λ, **a** and **b**,

(i) $\overrightarrow{NS}$ (ii) $\overrightarrow{MS}$

(2)

Given also that $\overrightarrow{MS} = \mu \overrightarrow{MC}$, where μ is a scalar,

(c) write down an expression for $\overrightarrow{MS}$ in terms of μ, **a** and **b**.

(1)

(d) Hence find the value of λ and the value of μ

(5)

The area of parallelogram $OACB$ is 80 square units.

(e) Find the area of

(i) triangle CAN,

(ii) triangle CNS.

(2)

Question 9 continued

Question 9 continued

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

Question 9 continued

(Total for Question 9 is 13 marks)