10.

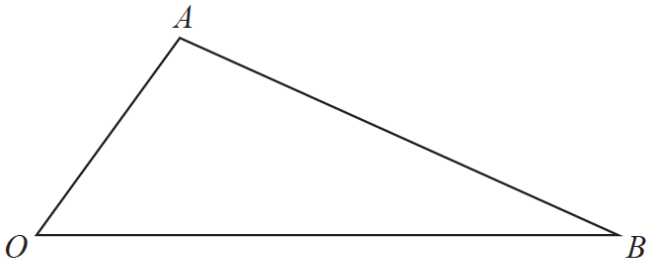

Figure 7

Figure 7 shows a sketch of triangle OAB.

The point C is such that $\overrightarrow{OC} = 2\overrightarrow{OA}$.

The point M lies on AB such that $AM:MB = 2:1$.

The straight line through C and M cuts OB at the point N.

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

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

(2)

(b) Find $\overrightarrow{ON}$ in terms of k, where k is a scalar constant and a coefficient to $\overrightarrow{CM}$.

(2)

(c) Hence find the ratio $ON : NB$.

(2)

(Total for Question 10 is 6 marks)