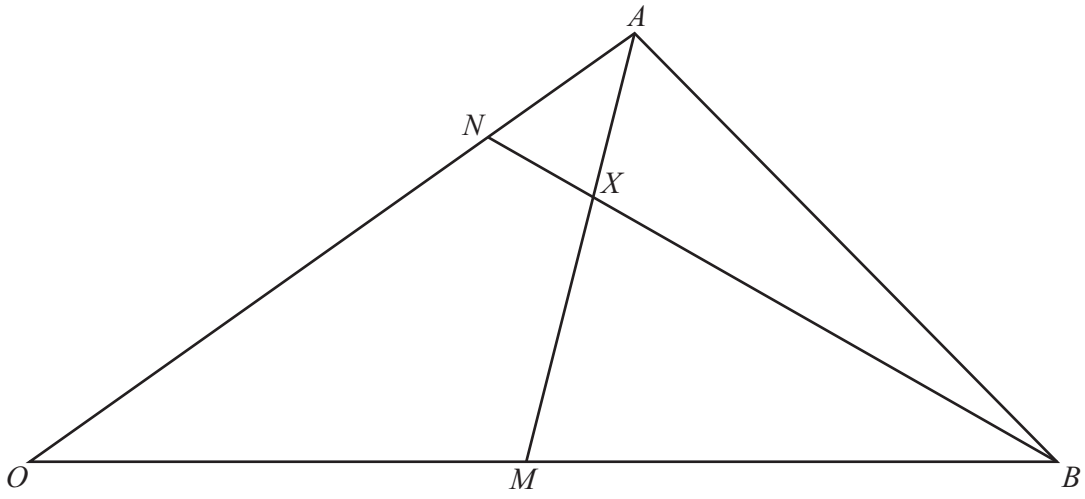
11



In the diagram, $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.
The point M is the midpoint of OB.
The point N is such that $\overrightarrow{ON} = 3\overrightarrow{NA}$.
The lines BN and AM intersect at the point X.
$\overrightarrow{BX} = \lambda\overrightarrow{BN}$, where λ is a constant.
$\overrightarrow{MX} = \mu\overrightarrow{MA}$, where μ is a constant.

(a) Find $\overrightarrow{OX}$ in terms of **a**, **b** and λ. [3]

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(b) Find $\overrightarrow{OX}$ in terms of **a**, **b** and μ. [2]

(c) Hence find the values of λ and μ. [4]

Question 12 is printed on the next page.

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12 It is given that $y = x\mathrm{e}^{3x+2}$.

(a) Find $\dfrac{\mathrm{d}y}{\mathrm{d}x}$. [3]

(b) Hence find $\displaystyle\int x\mathrm{e}^{3x+2}\mathrm{d}x$. [4]

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