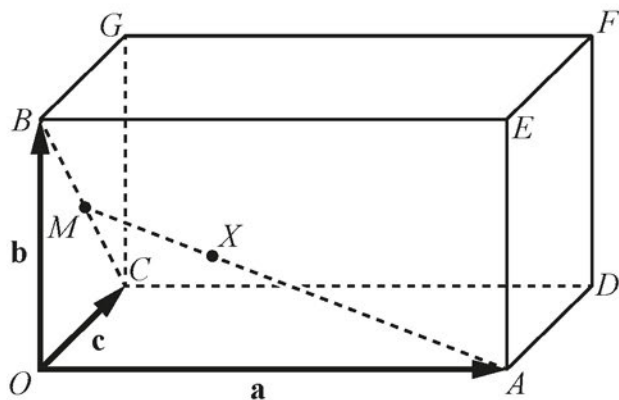**9** Points A, B and C have position vectors $\mathbf{a}$, $\mathbf{b}$ and $\mathbf{c}$ relative to an origin O in 3-dimensional space. Rectangles $OADC$ and $BEFG$ are the base and top surface of a cuboid.

- The point M is the midpoint of BC.

- The point X lies on AM such that $AX = 2XM$.

(a) Find $\overrightarrow{OX}$ in terms of $\mathbf{a}$, $\mathbf{b}$ and $\mathbf{c}$, simplifying your answer. **[4]**

(b) Hence show that the lines OF and AM intersect. **[2]**