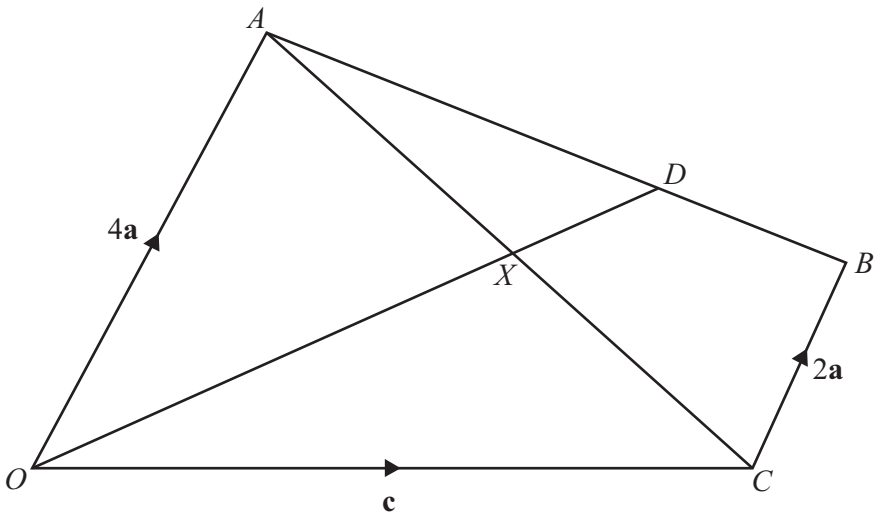
9



The diagram shows the trapezium $OABC$, where $\overrightarrow{OA} = 4\mathbf{a}$, $\overrightarrow{OC} = \mathbf{c}$, and $\overrightarrow{CB} = 2\mathbf{a}$. The point D lies on AB such that $AD : DB = 2 : 1$. The point X is the point of intersection of the lines OD and AC. It is given that $\overrightarrow{AX} = \lambda\overrightarrow{AC}$ and $\overrightarrow{OX} = \mu\overrightarrow{OD}$.

Find in terms of **a** and **c**

(a) $\overrightarrow{AB}$ [1]

(b) $\overrightarrow{OD}$. [2]

(c) Find $\overrightarrow{OX}$ in terms of **a**, **c** and μ. [1]

(d) Find $\overrightarrow{AX}$ in terms of **a**, **c** and λ. [2]

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

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10 **(a)** Solve the equation $7\tan^2\theta + 5\tan\theta - 2 = 0$, for $-180° \leqslant \theta \leqslant 180°$. [4]

(b) Solve the equation $3\sin(3\phi - 1.5) - 2 = 0$, for $0 < \phi < 3$, where ϕ is in radians. [5]

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