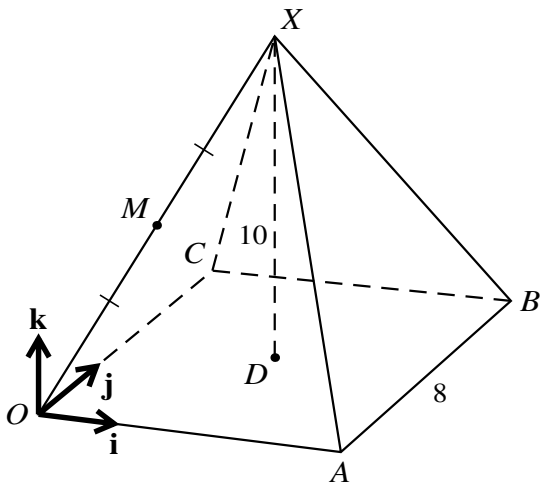
7



The diagram shows a pyramid $OABCX$. The horizontal square base $OABC$ has side 8 units and the centre of the base is D. The top of the pyramid, X, is vertically above D and $XD = 10$ units. The mid-point of OX is M. The unit vectors **i** and **j** are parallel to $\overrightarrow{OA}$ and $\overrightarrow{OC}$ respectively and the unit vector **k** is vertically upwards.

(i) Express the vectors $\overrightarrow{AM}$ and $\overrightarrow{AC}$ in terms of **i**, **j** and **k**. [3]

(ii) Use a scalar product to find angle MAC. [4]