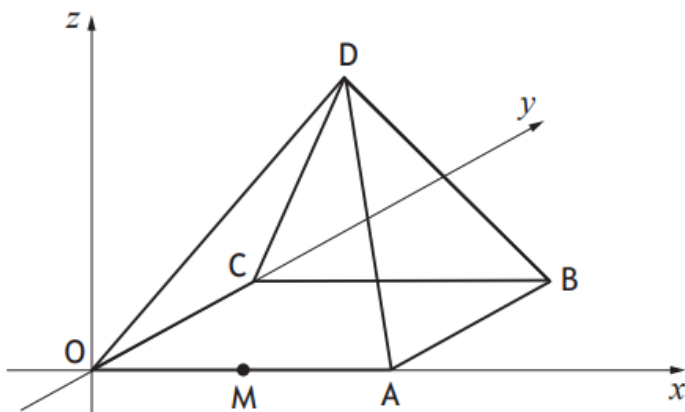D,OABC is a square-based pyramid as shown.

- O is the origin and OA = 4 units.

- M is the mid-point of OA.

- $\overrightarrow{OD} = 2\mathbf{i} + 2\mathbf{j} + 6\mathbf{k}$

(a) Express $\overrightarrow{DB}$ and $\overrightarrow{DM}$ in component form.   **3**

(b) Find the size of angle BDM.   **5**

Answers:

(a) $\begin{pmatrix} 2 \\ 2 \\ -6 \end{pmatrix} \begin{pmatrix} 0 \\ -2 \\ -6 \end{pmatrix}$

(b)   40.3° or 0.703 radians