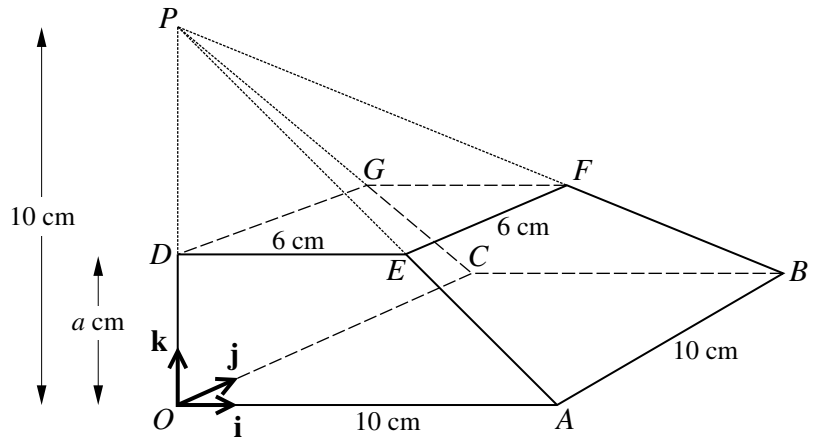
9



The diagram shows a pyramid $OABCP$ in which the horizontal base $OABC$ is a square of side 10 cm and the vertex P is 10 cm vertically above O. The points D, E, F, G lie on OP, AP, BP, CP respectively and $DEFG$ is a horizontal square of side 6 cm. The height of $DEFG$ above the base is a cm. Unit vectors **i**, **j** and **k** are parallel to OA, OC and OD respectively.

(i) Show that $a = 4$. [2]

(ii) Express the vector $\overrightarrow{BG}$ in terms of **i**, **j** and **k**. [2]

(iii) Use a scalar product to find angle GBA. [4]