GCSE VECTORS

26

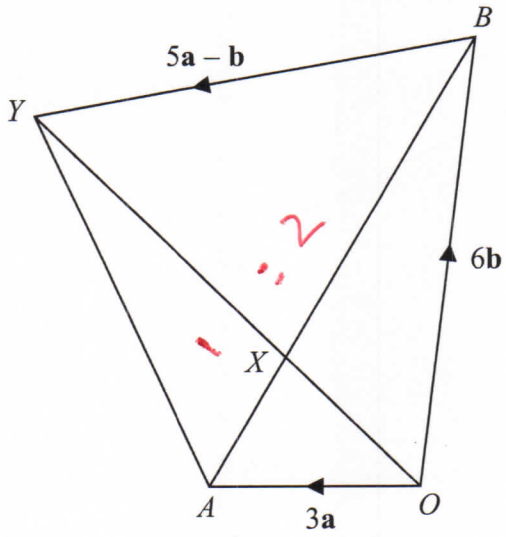

Diagram **NOT** accurately drawn

OAYB is a quadrilateral.

$\overrightarrow{OA} = 3\mathbf{a}$

$\overrightarrow{OB} = 6\mathbf{b}$

(a) Express $\overrightarrow{AB}$ in terms of **a** and **b**.

$\overrightarrow{AB} = \overrightarrow{AO} + \overrightarrow{OB}$

$= -3\underline{a} + 6\underline{b}$

$\overrightarrow{AB} = 6\underline{b} - 3\underline{a}$

(1)

X is the point on AB such that $AX : XB = 1 : 2$

and $\overrightarrow{BY} = 5\mathbf{a} - \mathbf{b}$

*(b) Prove that $\overrightarrow{OX} = \frac{2}{5}\overrightarrow{OY}$

$\overrightarrow{OY} = \overrightarrow{OB} + \overrightarrow{BY}$

$= 6\underline{b} + 5\underline{a} - \underline{b}$

$= 5\underline{b} + 5\underline{a} = 5(\underline{a} + \underline{b})$

$\overrightarrow{OX} = \overrightarrow{OA} + \overrightarrow{AX}$

$= \overrightarrow{OA} + \frac{1}{3}\overrightarrow{AB}$

$= 3\underline{a} + \frac{1}{3}(6\underline{b} - 3\underline{a})$

$= 3\underline{a} + 2\underline{b} - \underline{a}$

$= 2\underline{a} + 2\underline{b} = 2(\underline{a} + \underline{b})$

$\therefore \overrightarrow{OX} = \frac{2}{5}\overrightarrow{OY}$

(4)

(Total for Question 26 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS