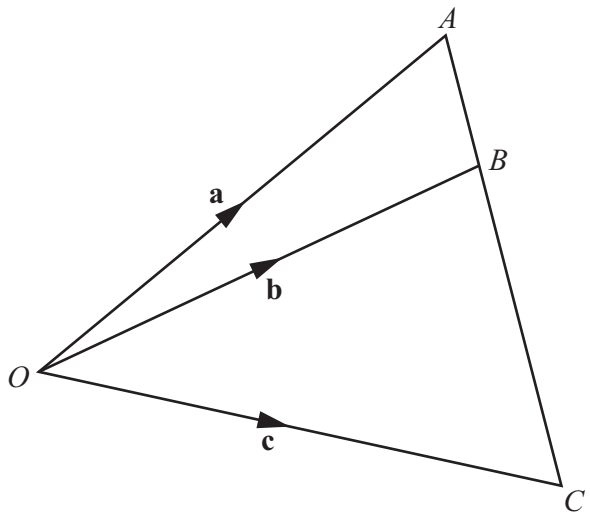
**4**




The diagram shows the triangle $OAC$. The point $B$ lies on $AC$ such that $AB:BC = p:q$, where $p$ and $q$ are constants ($p \neq -q$).

$\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OB} = \mathbf{b}$ and $\overrightarrow{OC} = \mathbf{c}$.

Show that $\mathbf{b} = \dfrac{q\mathbf{a} + p\mathbf{c}}{q+p}$. [5]

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**5** Given that $\log_a(p+1) + \dfrac{1}{\log_p a} - \log_a(p+2) + \log_a 5 = \log_a 12$, find the value of $p$. [5]

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