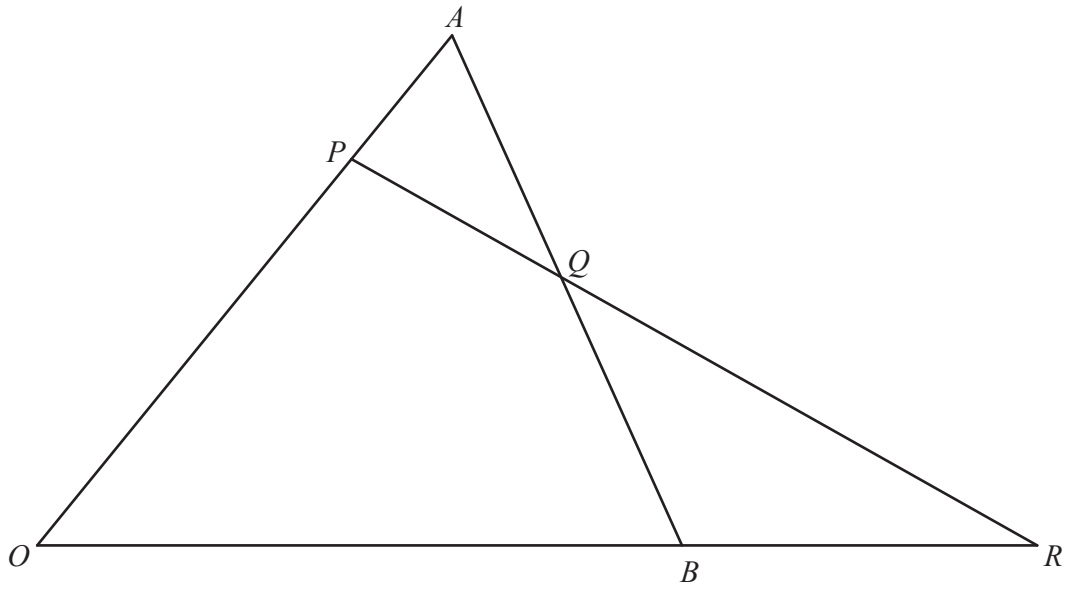
8



The diagram shows a triangle OAB such that $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$. The point P lies on OA such that $OP = \frac{3}{4}OA$. The point Q is the mid-point of AB. The lines OB and PQ are extended to meet at the point R. Find, in terms of **a** and **b**,

(a) $\overrightarrow{AB}$, [1]

(b) $\overrightarrow{PQ}$. Give your answer in its simplest form. [3]

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It is given that $n\overrightarrow{PQ} = \overrightarrow{QR}$ and $\overrightarrow{BR} = k\mathbf{b}$, where n and k are positive constants.

(c) Find $\overrightarrow{QR}$ in terms of n, **a** and **b**. [1]

(d) Find $\overrightarrow{QR}$ in terms of k, **a** and **b**. [2]

(e) Hence find the value of n and of k. [3]