9 In this question, all lengths are in metres.

(a) A particle P has position vector $\begin{pmatrix} 2+12t \\ 5-5t \end{pmatrix}$ at a time t seconds, $t \geqslant 0$.

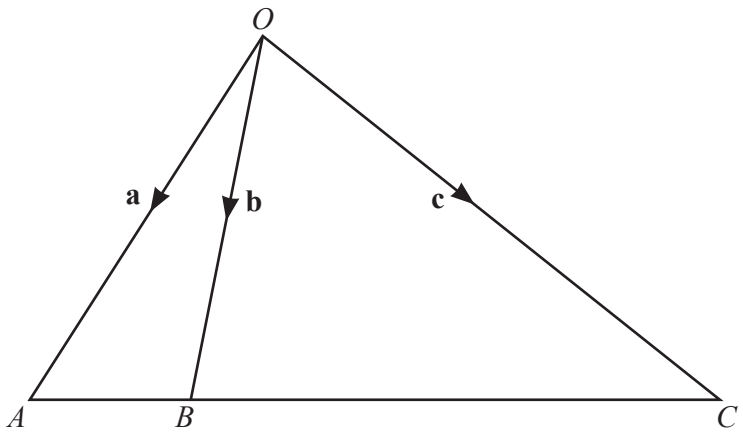
(i) Write down the initial position vector of P. [1]

(ii) Find the speed of P. [2]

(iii) Determine whether P passes through the point with position vector $\begin{pmatrix} 158 \\ -48 \end{pmatrix}$. [2]

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(b)



The diagram shows the triangle OAC. The point B lies on AC such that $AB:AC = 1:4$. Given that $\overrightarrow{OA} = \mathbf{a}$, $\overrightarrow{OB} = \mathbf{b}$ and $\overrightarrow{OC} = \mathbf{c}$, find $\mathbf{c}$ in terms of $\mathbf{a}$ and $\mathbf{b}$. [3]

Question 10 is printed on the next page.