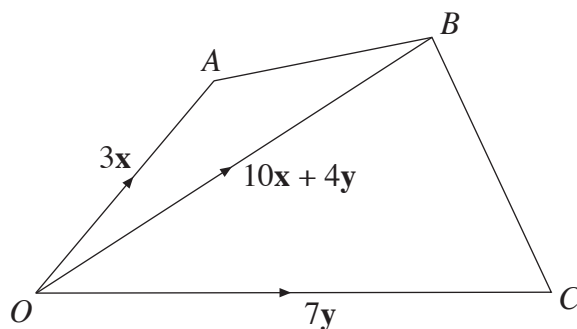


25. The diagram shows a quadrilateral  $OABC$ .



*Diagram not drawn to scale.*

In the quadrilateral  $OABC$ , the vectors  $\mathbf{OA}$ ,  $\mathbf{OB}$  and  $\mathbf{OC}$  are given by  $\mathbf{OA} = 3\mathbf{x}$ ,  $\mathbf{OB} = 10\mathbf{x} + 4\mathbf{y}$  and  $\mathbf{OC} = 7\mathbf{y}$ .

(a) Express  $\mathbf{CA}$  in terms of  $\mathbf{x}$  and  $\mathbf{y}$ .

.....

.....

.....

[1]

(b) Given that  $M$  is the mid-point of  $OB$ , express each of the following in terms of  $\mathbf{x}$  and  $\mathbf{y}$  in their simplest form.

(i)  $\mathbf{OM}$

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.....

.....

(ii)  $\mathbf{MA}$

.....

.....

.....

[2]

(c) Does  $M$  lie on the line  $CA$ ? Give a reason for your answer.

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.....

.....

[1]