

Surname	
Other Names	
Candidate's Signature	

GCSE 9 - 1 Questions

Vectors

Calculator Allowed

INSTRUCTIONS TO CANDIDATES

Write your name in the space provided.

Write your answers in the spaces provided in this question paper.

Answer ALL questions.

Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

You should have a ruler, compass and protractor where required.

Total Marks :

1) Vectors **OA** and **OB** are shown in the diagram below.

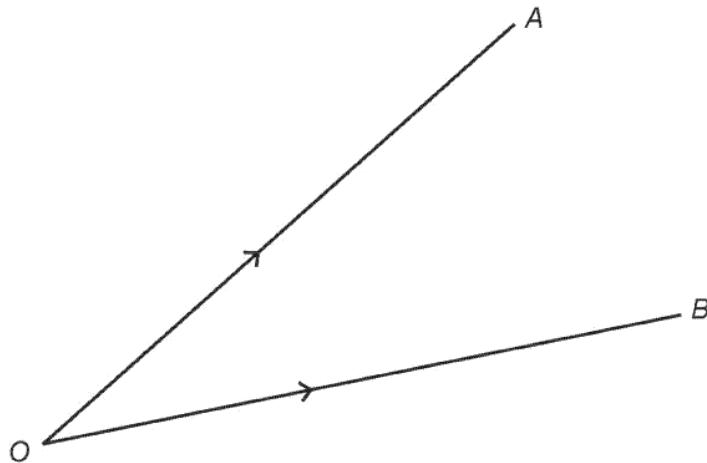


Diagram not drawn to scale

Given that **OA** = $3x + 7y$ and **OB** = $4x + 2y$, express **AB** in terms of x and y in its simplest form. [2]

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2) Given that **OA** = $12x + 8y$, **OB** = $5x + 10y$ and **CO** = $-14x + 11y$, write down each of the following vectors in its simplest form.

(a) **BA** [2]

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(b) **AC** [2]

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3) The vectors OM , ON and OP are shown in the diagram below.

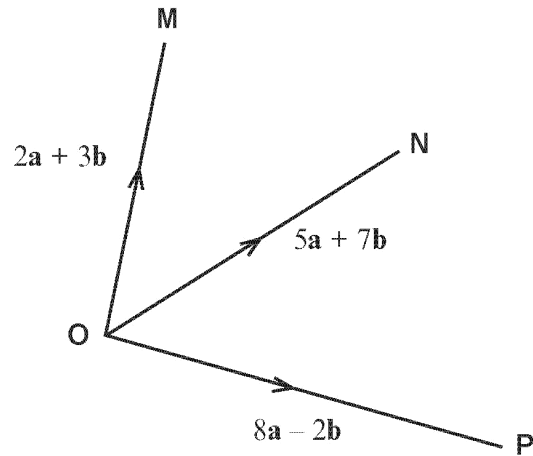


Diagram not drawn to scale

- (a) Find MN in terms of a and b .
Give your answer in its simplest form. [2]

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- (b) The point R is the mid-point of OP .
Find RN in terms of a and b .
Give your answer in its simplest form. [3]

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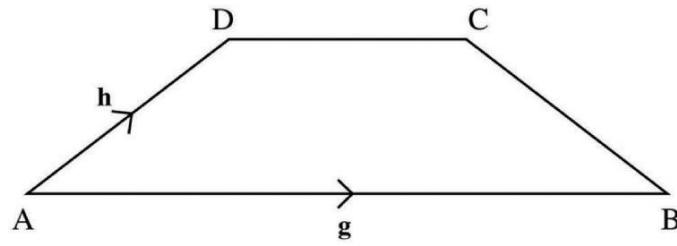
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- 4) ABCD is a trapezium with AB parallel to DC and $AB = 3DC$.

$$\vec{AB} = \mathbf{g} \text{ and } \vec{AD} = \mathbf{h}$$



Express in terms of \mathbf{g} and \mathbf{h}

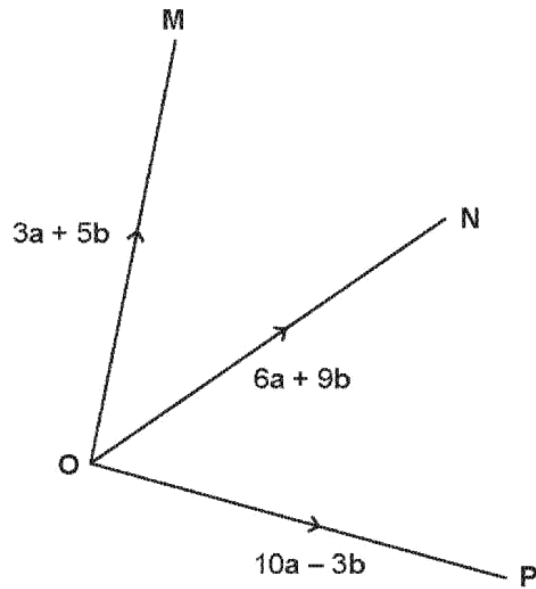
(a) \vec{AC}

Answer _____ [2]

(b) \vec{BC}

Answer _____ [2]

5) The vectors \mathbf{OM} , \mathbf{ON} and \mathbf{OP} are shown in the diagram below.



(a) Find \mathbf{NP} in terms of a and b .
Give your answer in its simplest form. [2]

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(b) The point \mathbf{S} is the mid-point of \mathbf{OM} .
Find \mathbf{SN} in terms of a and b .
Give your answer in its simplest form. [3]

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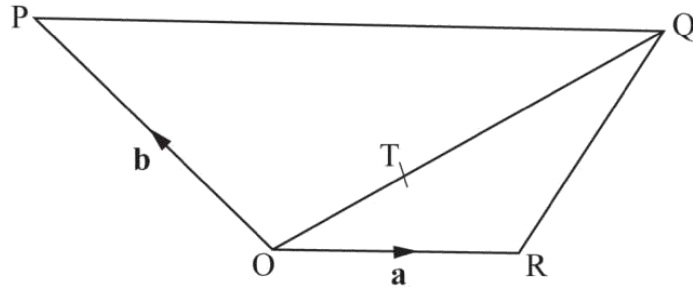
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6) The diagram shows a quadrilateral OPQR.

$$\vec{OR} = \mathbf{a} \text{ and } \vec{OP} = \mathbf{b}$$

T is a point on OQ such that $\vec{OT} = \frac{1}{3}\vec{OQ}$

$$\vec{PQ} = 2\vec{OR}$$



What is the ratio PT : TR?

Show all your working.

Answer PT : TR = _____ [4]