

AQA, OCR, Edexcel

GCSE

GCSE Maths

Vectors Answers

Name:

M

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Mathsmadeeasy.co.uk

Total Marks: /24

Vectors

1.

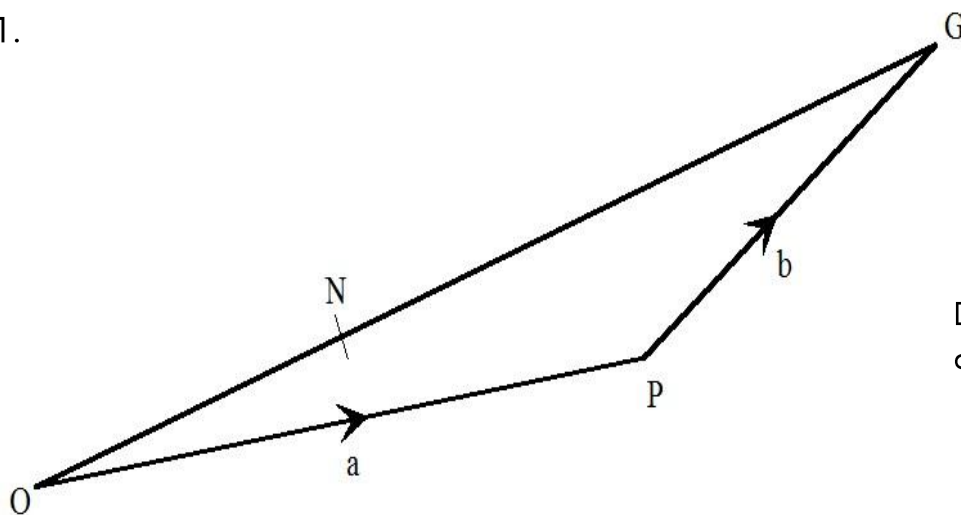


Diagram NOT
accurately drawn

OPG is a triangle.

N is a point on OG such that $ON : NG = 2 : 3$

$$\overrightarrow{OP} = \mathbf{a}$$

$$\overrightarrow{PG} = \mathbf{b}$$

a) Express \overrightarrow{OG} in terms of \mathbf{a} and \mathbf{b} .

$$= \mathbf{a} + \mathbf{b}$$

(1 Mark)

b) Express \overrightarrow{ON} in terms of \mathbf{a} and \mathbf{b} . Give your answer in its simplest form.

$$= \frac{2}{5}\mathbf{a} + \frac{2}{5}\mathbf{b}$$

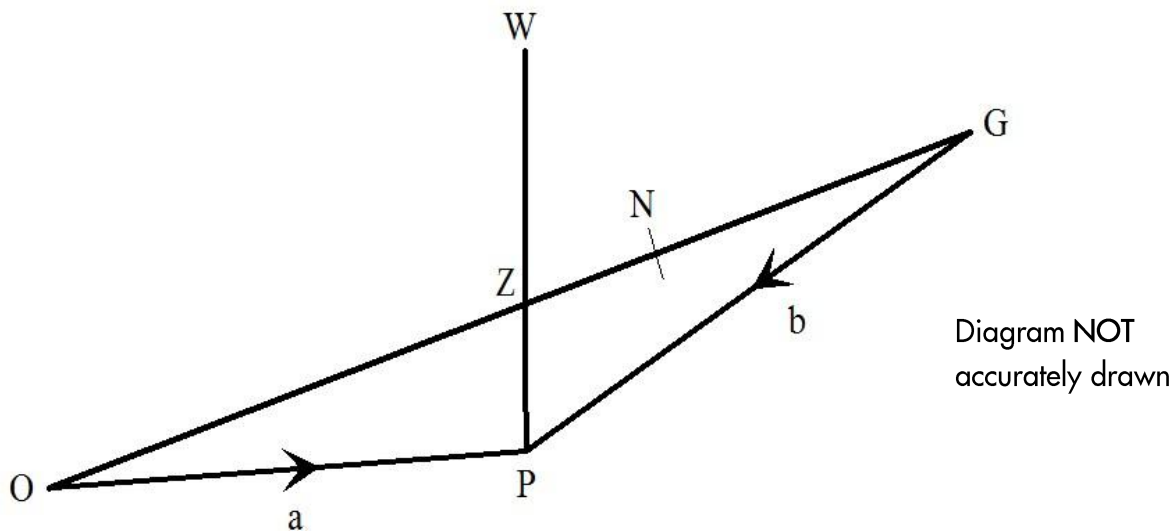
(3 Marks)

a) Express \overrightarrow{PN} in terms of \mathbf{a} and \mathbf{b} . Give your answer in its simplest form.

$$= -\frac{3}{5}\mathbf{a} + \frac{2}{5}\mathbf{b}$$

(4 Marks)

2.



In the diagram,

$$\overrightarrow{OP} = a \text{ and } \overrightarrow{GP} = b$$

N is a point on \overrightarrow{OG} such that $\overrightarrow{ON} : \overrightarrow{NG} = 3 : 1$

a) Express \overrightarrow{OG} in terms of a and b .

$$= a - b$$

(1 Mark)

b) Express \overrightarrow{ON} in terms of a and b .

$$= \frac{3}{4}a - \frac{3}{4}b$$

(2 Marks)

$\overrightarrow{PZ} = \overrightarrow{GN}$, Z is a point on \overrightarrow{PW} such that $\overrightarrow{PZ} : \overrightarrow{ZW} = 1 : 2$

b) Express \overrightarrow{OW} in terms of a and b . Give your answer in its simplest form. **(Hard)**

$$= \frac{3}{4}b + \frac{1}{4}a$$

(3 Marks)

3.

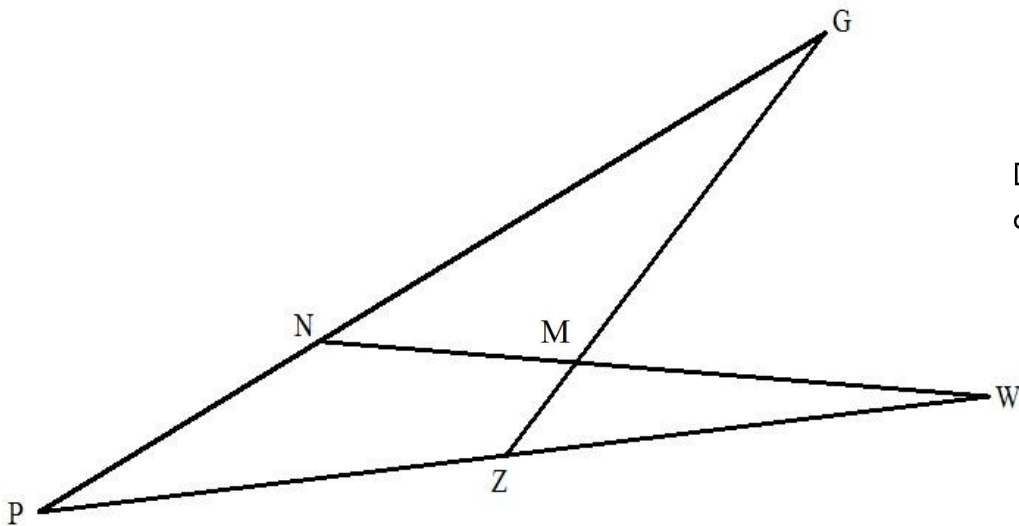


Diagram NOT
accurately drawn

In the diagram,

$$\overrightarrow{PZ} = 2a \text{ and } \overrightarrow{PN} = 3b$$

Z is a point on \overrightarrow{PW} such that $\overrightarrow{PZ} : \overrightarrow{ZW} = 1:3$

N is a point on \overrightarrow{PG} such that $\overrightarrow{PN} : \overrightarrow{NG} = 1:2$

a) Express \overrightarrow{PW} in terms of a .

$$= 8a$$

(1 Mark)

b) Express \overrightarrow{PG} in terms of a and b

$$= 9b$$

(1 Mark)

c) Express \overrightarrow{WN} in terms of a and b . Give your answer in its simplest form.

$$= -8a + 3b$$

(2 Marks)

M is a point on \overrightarrow{GZ} such that $\overrightarrow{GM} : \overrightarrow{MZ} = 2:1$

M is a point on \overrightarrow{WN} such that $\overrightarrow{WM} : \overrightarrow{MN} = 3:2$

d) Show that $\overrightarrow{GM} = \frac{1}{3}(-18b + 4a)$

$$\overrightarrow{GM} = \frac{2}{3}(-9b + 2a)$$

Multiply out, then factorise by $\frac{1}{3}$

(3 Marks)

e) Show that $\overrightarrow{MN} = \frac{1}{5}(-16a + 6b)$

$$\overrightarrow{MN} = \frac{2}{5}(-8a + 3b)$$

Multiply out then factorise by $\frac{1}{5}$

(3 Marks)