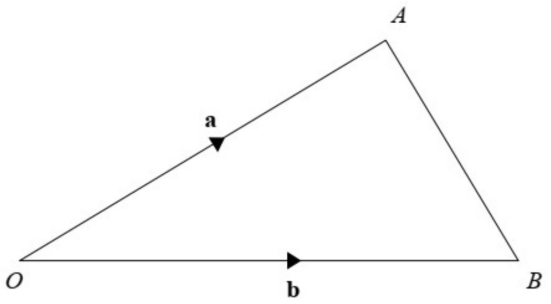
1.



$\vec{OA} = \boldsymbol{a}$

$\vec{OB} = \boldsymbol{b}$

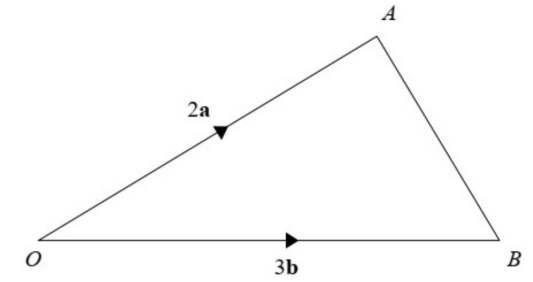
P is the point on AB such that AP:PB = 1:3

$\vec{OP} = k(3\boldsymbol{a} + \boldsymbol{b})$

Find the value of k

(4 marks)

2.



$\vec{OA} = 2\text{a}$

$\vec{OB} = 3\text{b}$

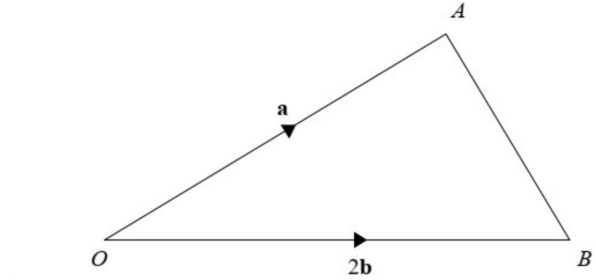
P is the point on AB such that AP:PB = 3:2

$\vec{OP} = k(4\boldsymbol{a}+9\boldsymbol{b})$

Find the value of k

(4 marks)

3.

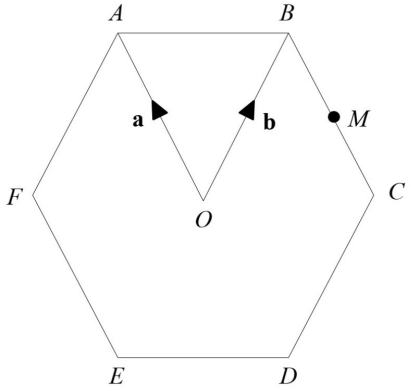


$\vec{OA} = \boldsymbol{a}$
$\vec{OB} = 2\,\boldsymbol{b}$

P is the point on AB such that AP:PB = 3:2
$\vec{OP} = k(\boldsymbol{a} + 3\boldsymbol{b})$
Find the value of k

(4 marks)

4. *ABCDEF* is a regular hexagon with centre *O*.



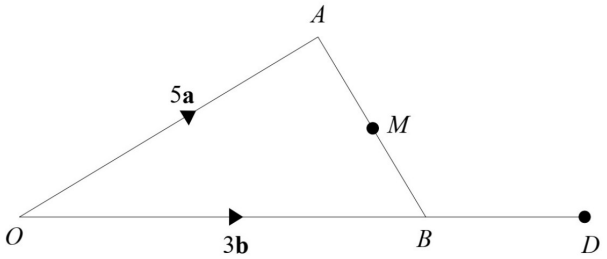
$\vec{OA} = a$
$\vec{OB} = b$

M is the midpoint of *BC*.
X is the point on *AB* extended, such that *AB*:*BX* = 3:2

Prove that *E*, *M* and *X* are on the same straight line.

(5 marks)

5.



$\vec{OA} = 5a$

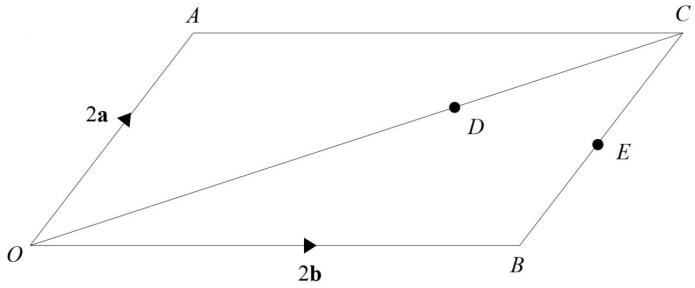
$\vec{OB} = 3b$

C is the point such that OC:CA = 4:1
M is the midpoint of AB
D is the point such that OB:OD = 3:4

Show that C, M and D are on the same straight line.

(5 marks)

6. The diagram shows a parallelogram.

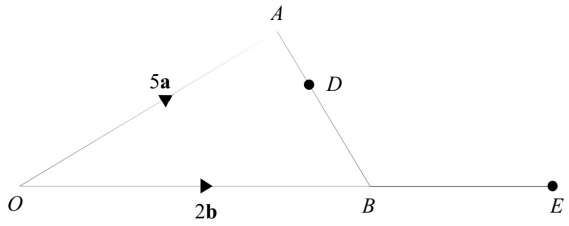


$\vec{OA} = 2a$
$\vec{OB} = 2b$

D is the point on OC such that OD:DC = 2:1
E is the midpoint of BC
Show that A, D and E are on the same straight line.

(Total for question 6 is 4 marks)

7.



$\vec{OA} = 5a$
$\vec{OB} = 2b$

C is the point on OA such that OC:CA = 4:1
D is the point such that AD:DB = 1:2
The line OB is extended to point E
Given that C, D and E are on the same straight line find $\vec{BE}$

(5 marks)