Name: _____

ASM Tuition Academy

VECTORS PROOF

Instructions:

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
  - there may be more space than you need.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all you're working out.**

Information:

- The marks for each question are shown in brackets
  - use this as a guide as to how much time to spend on each question.

Advice:

- Read each question carefully before you start to answer it.
- Keep an eye on time.
- Try to answer every question.
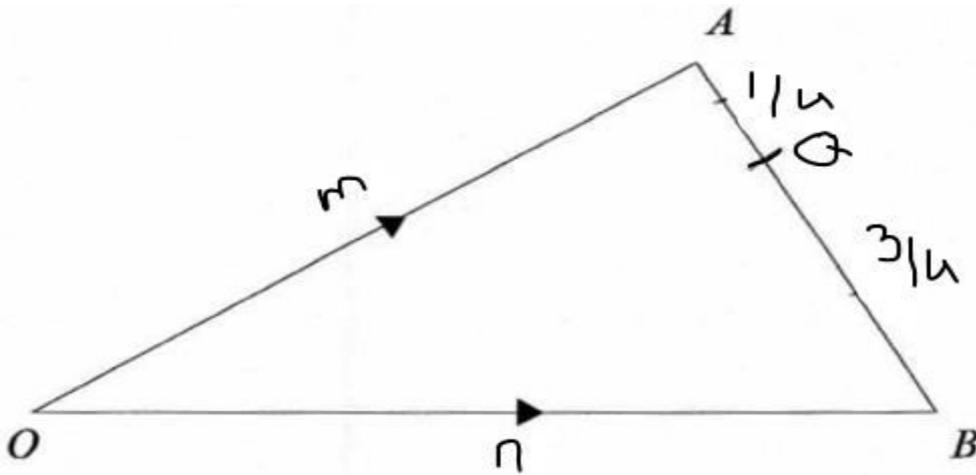- Check your answers if you have time at the end.

Q1)

$\vec{OA} = m$

$\vec{OB} = n$

Q is the point on AB such that AQ : QB = 1:3

$\vec{QP} = l(3m + n)$

Find the value of l

Q2)

$\vec{OA} = 2m$

$\vec{OB} = 3n$

Q is the point on AB such that AQ:BQ = 3:2

$\vec{OQ} = l\,(4m + 9n)$

Find the value of l
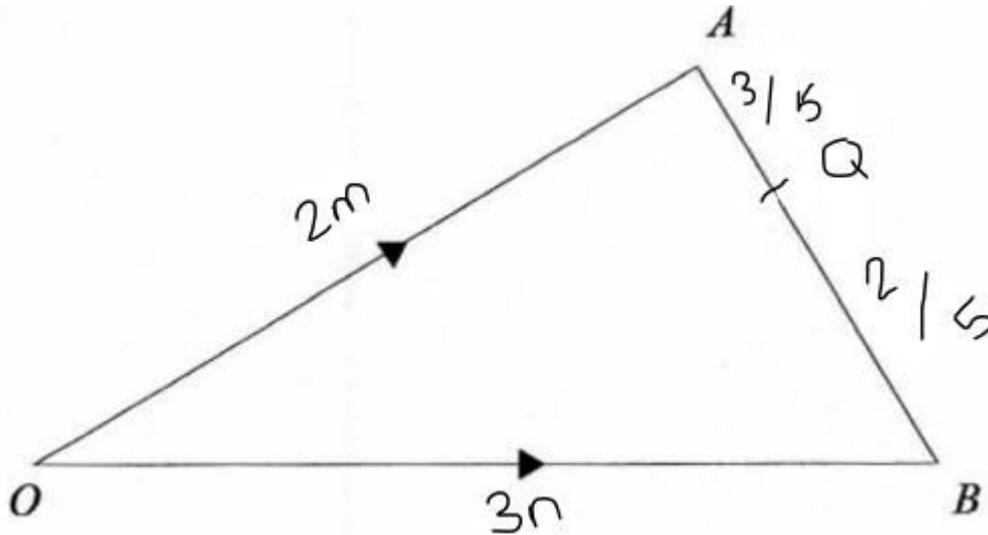
(Total for Question 2 is 4 marks)

Q3)

$\vec{OA} = m$

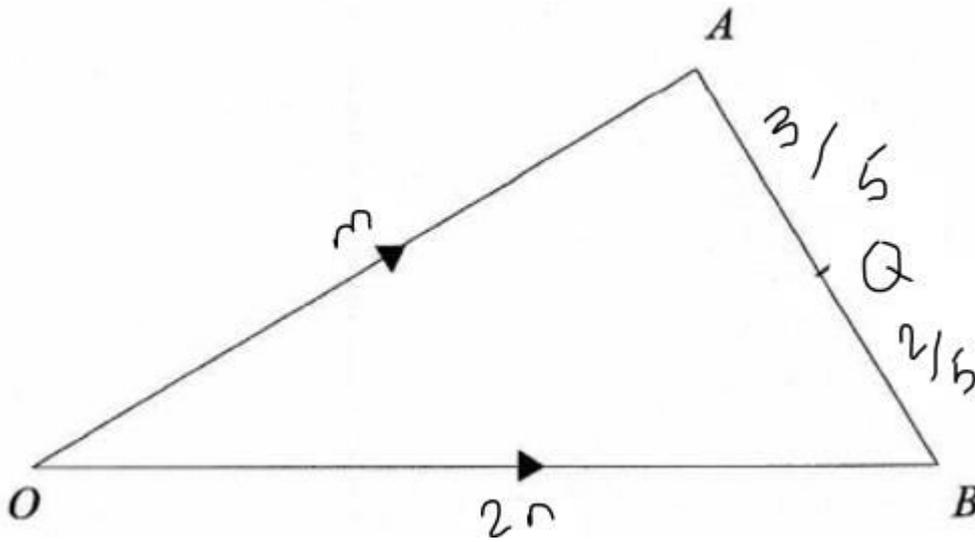$\vec{OB} = 2n$

Q is the point on AB such that AQ:QB = 3:2

$\vec{OQ} = l\,(m + 3n)$

Find the value of l

(Total for Question 3 is 4 marks)
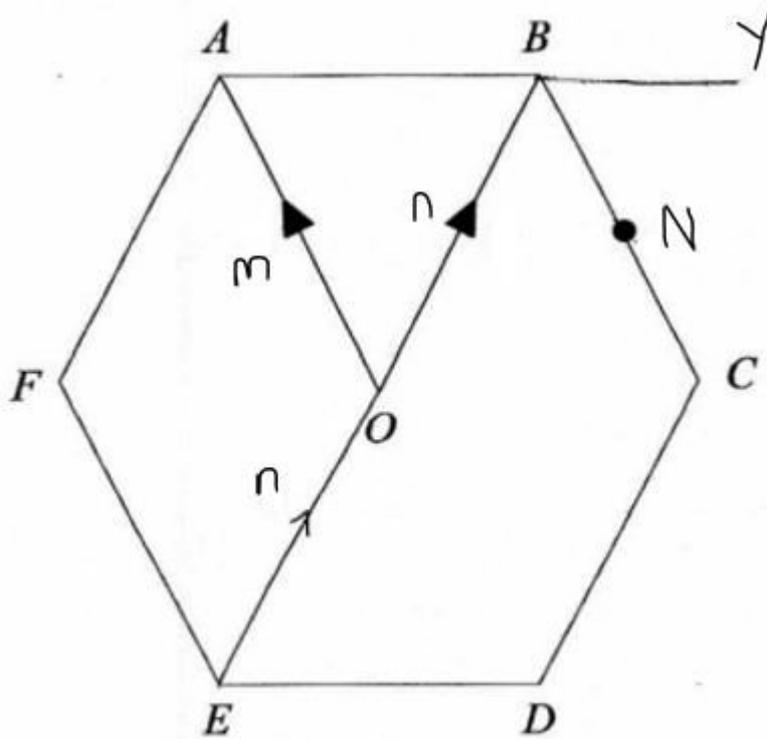
Q4)

ABCDEF is a regular hexagon with centre O.

$\vec{OA} = \mathbf{m}$

$\vec{OB} = \mathbf{n}$

N is the midpoint of BC.

Y is the point on AB extended, such that AB:BY = 3:2

Prove that E, N, and Y are on the same straight line

Q5)

$\vec{OA} = 6m$
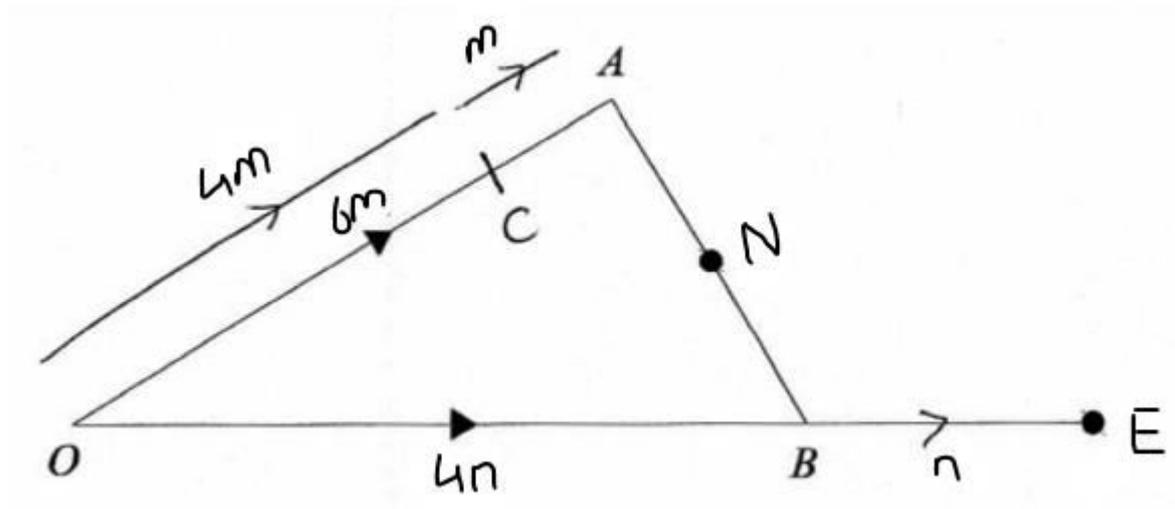
$\vec{OB} = 4n$

C is the point such that OC:CA = 4:1

N is the midpoint of AB

E is the point such that OB : OE = 3:4

Show that C, N and E are on the same straight line

Q6) The diagram shows a parallelogram
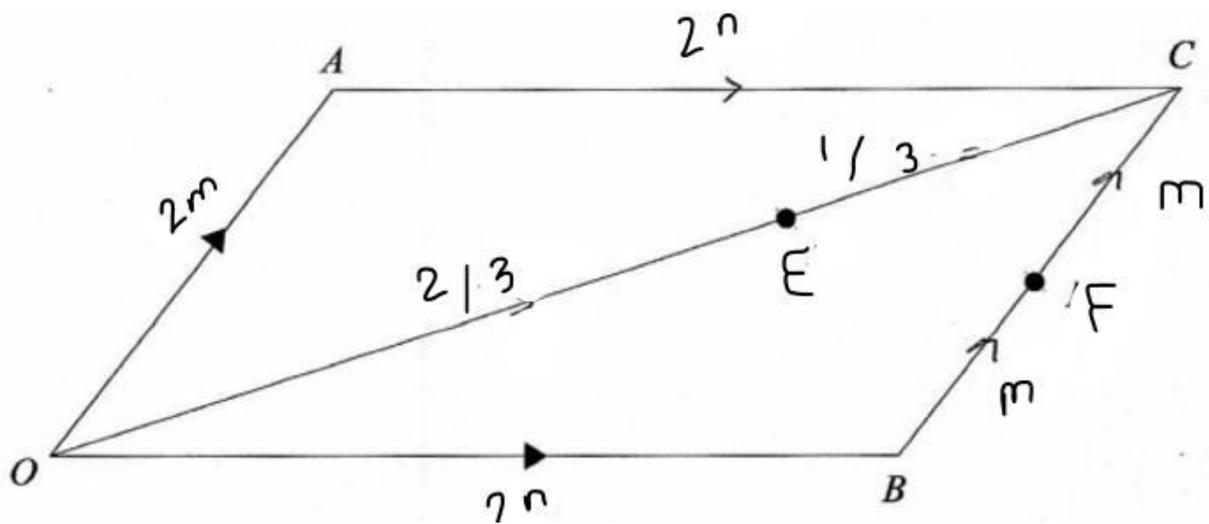
$\vec{OA} = 2m$

$\vec{OB} = 2n$

E is the point on OC such that OE:EC = 2:1

F is the midpoint of BC

Show that A, E and F are on the same straight line

Q7)

$\vec{OA} = 5m$
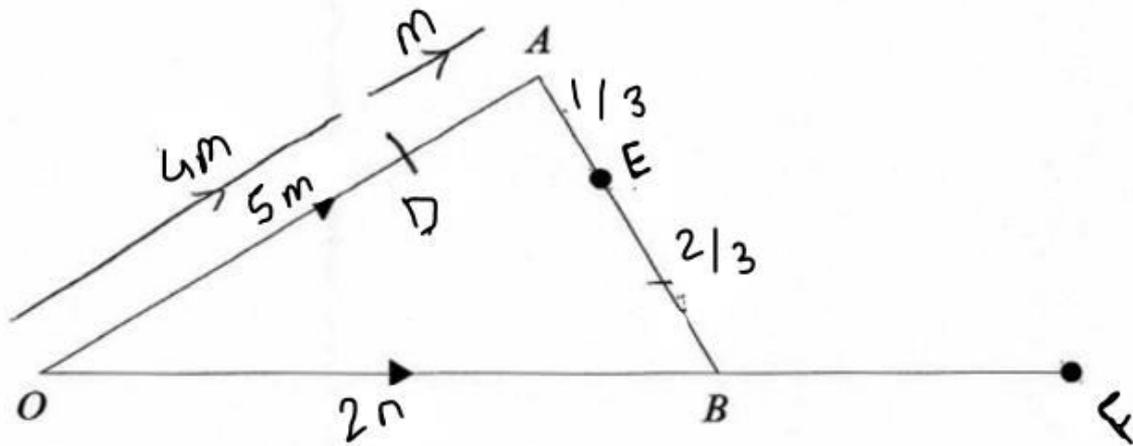
$\vec{OB} = 2n$

D is the point on OA such that OD:DA = 4:1

E is the point on AB such that AE:EB = 1:2

The line OB is extended to point F

Given that D, E and F are on the same straight line, find $\vec{BF}$

(Total for Question 7 is 5 marks)