Name: _____

ASM Tuition Academy

Vectors

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.

1. **a =** $\begin{pmatrix} 1 \\ 4 \end{pmatrix}$ **and b =** $\begin{pmatrix} 2 \\ 6 \end{pmatrix}$

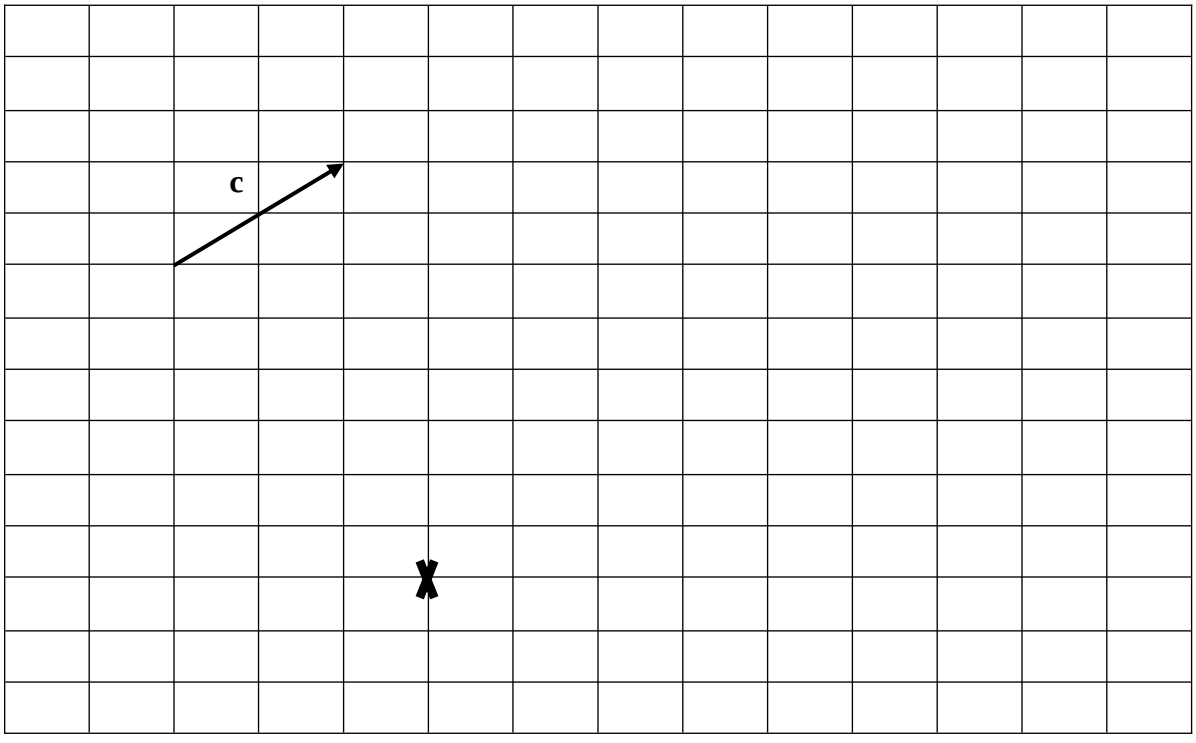
a) Write down as a column vector.

i) **a + b**

ii) **2a + b**

The vector c is drawn on the grid.

b) From the point P, draw the vector 3c.



(Total for question 1 is 4 marks)

2. $\mathbf{a} = \begin{pmatrix} 2 \\ 3 \end{pmatrix}$ **and** $\mathbf{b} = \begin{pmatrix} 1 \\ 4 \end{pmatrix}$

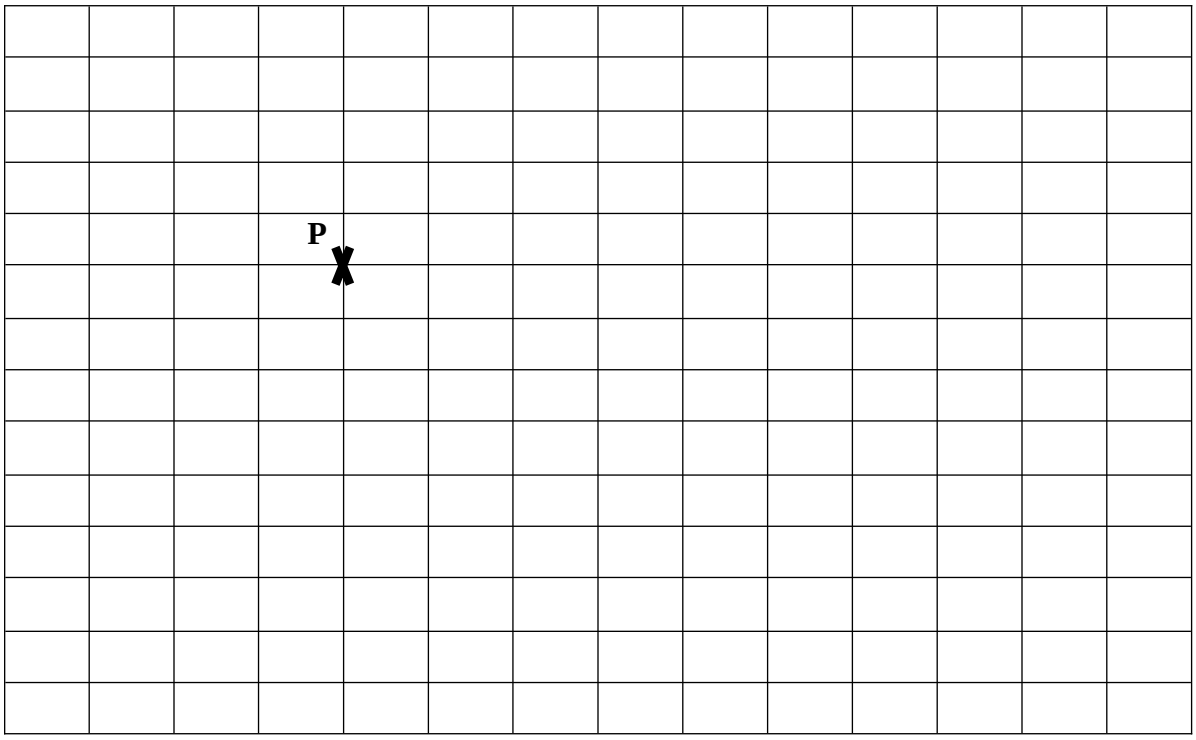
a) Write down as a column vector.

i) $\mathbf{a} + \mathbf{b}$

ii) $2\mathbf{a} - 4\mathbf{b}$

$\mathbf{c} = \begin{pmatrix} 6 \\ -3 \end{pmatrix}$

b) From the point P, draw the vector c.



(Total for question 2 is 4 marks)

3. **a =** $\begin{pmatrix} -4 \\ 2 \end{pmatrix}$ **and b =** $\begin{pmatrix} 5 \\ -2 \end{pmatrix}$

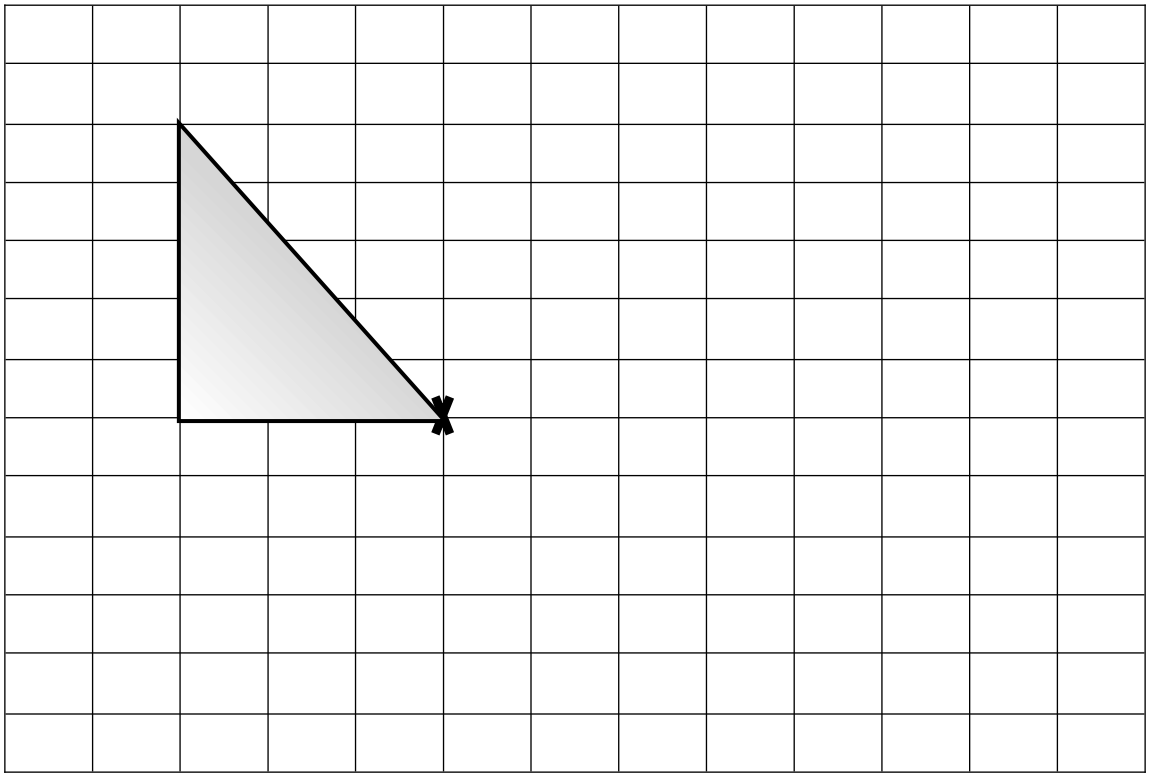
a) Write down as a column vector.

i) a + b

ii) 3a – b

c = $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$

b) Translate the triangle by the vector $\begin{pmatrix} 5 \\ -3 \end{pmatrix}$



(Total for question 3 is 4 marks)

4. A is the point (4, 5) and B is the point (3, -1).

a) Write down as a column vector $\overrightarrow{AB}$.

C is the point (4, -3) and D is the point (5, 1).

b) Write down as a column vector $\overrightarrow{CD}$.

(Total for question 4 is 2 marks)

5. A is the point (3, -2) and B is the point (5, -2).

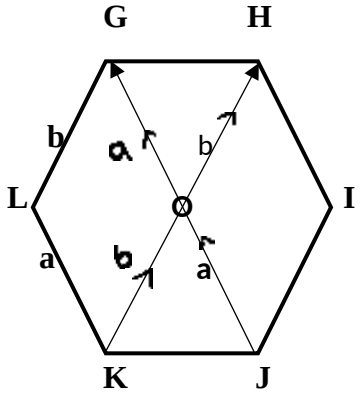
a) Write down as a column vector $\overrightarrow{AB}$.

C is the point (2, 5) and D is the point (-2, 7).

b) Write down as a column vector $\overrightarrow{CD}$.

(Total for question 5 is 2 marks)

6. GHIJKL is a triangle hexagon with Centre O.



$\overrightarrow{OG}$ = **a**

$\overrightarrow{OH}$ = **b**

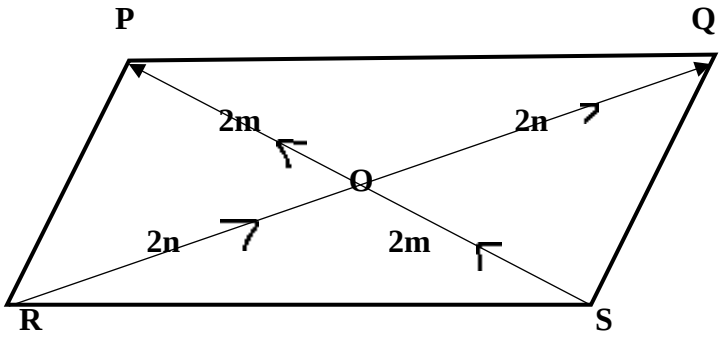
a) Find, in terms of a, the vector $\overrightarrow{GJ}$

b) Find, in terms of a and b, the vector $\overrightarrow{GH}$

c) Find, in terms of a and b, the vector $\overrightarrow{GL}$

(Total for question 6 is 3 marks)

7. The diagram shows a Parallelogram.



$\overrightarrow{OP}$ = **2m**

$\overrightarrow{OQ}$ = **2n**

a) Find, in terms of a, the vector $\overrightarrow{SP}$

_____

b) Find, in terms of a and b, the vector $\overrightarrow{PQ}$

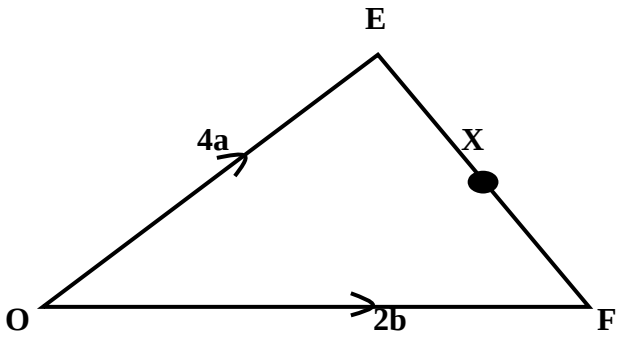
_____

c) Find, in terms of a and b, the vector $\overrightarrow{PR}$

_____

(Total for question 7 is 3 marks)

8.



$\overrightarrow{OE}$ = **4a**

$\overrightarrow{OF}$ = **2b**

a) Find, in terms of a and b, the vector $\overrightarrow{EF}$

b) Find, in terms of a and b, the vector $\overrightarrow{EX}$

c) Find, in terms of a and b, the vector $\overrightarrow{OX}$

(Total for question 8 is 3 marks)