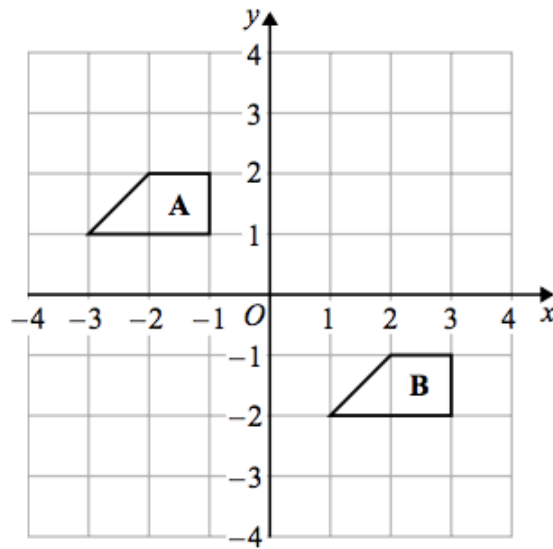


## Topic 18 Vectors and transformations (Pre-TT) [32]

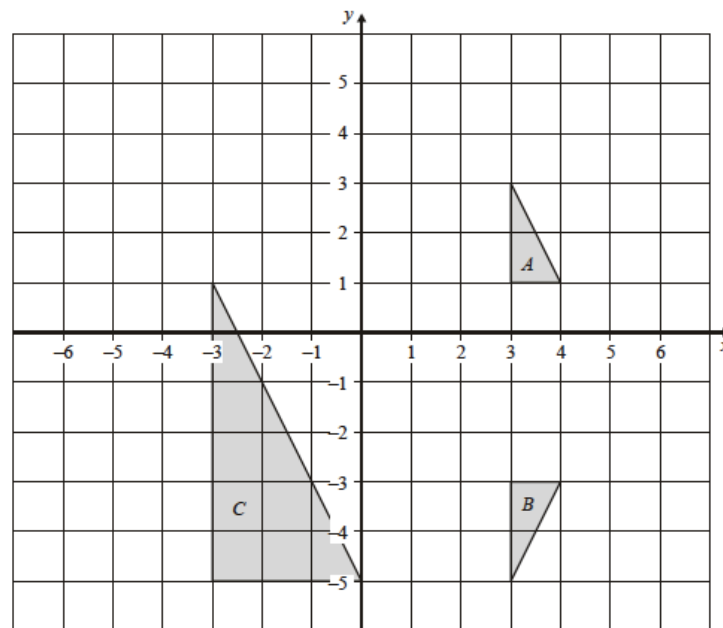
1.



Describe the single transformation that maps shape **A** onto shape **B**.

(Total 2 marks)

2.



(a) Describe the transformation that maps triangle *A* to triangle *B*. (2)

(b) Triangle *A* is rotated  $90^\circ$  anti-clockwise about  $(0, -1)$ .

Draw the image of *A* after this transformation.

(2)

(c) Triangle *C* is an enlargement of triangle *A*.

(i) Write down the scale factor of the enlargement. (1)

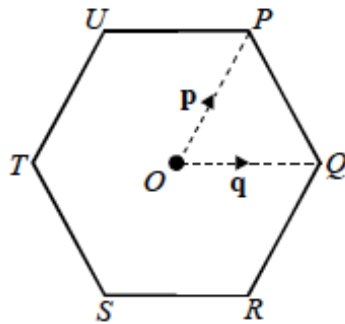
(ii) Write down the coordinates of the centre of the enlargement. (1)

(Total 6 marks)

3.

$PQRSTU$  is a regular hexagon and  $O$  is the centre of the hexagon.

$$\vec{OP} = \mathbf{p} \text{ and } \vec{OQ} = \mathbf{q}$$



Express each of the following vectors in terms of  $\mathbf{p}$  and  $\mathbf{q}$

(a)  $\vec{PQ}$

(1)

(b)  $\vec{SP}$

(1)

(c)  $\vec{SQ}$

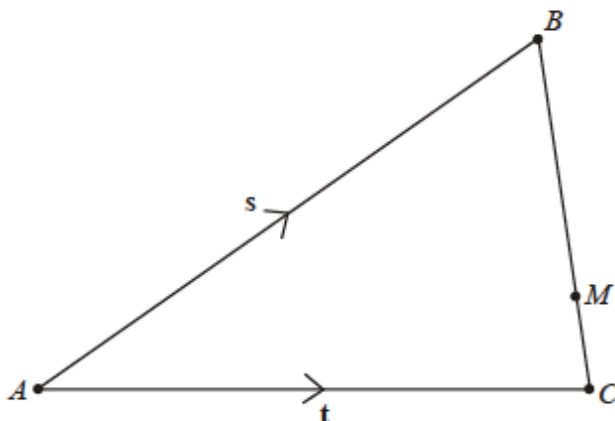
(2)

(Total 4 marks)

4. N.B. Question should read "Find  $\vec{AM}$  in terms of  $\mathbf{s}$  and  $\mathbf{t}$ ."

In triangle  $ABC$ ,  $M$  lies on  $BC$  such that  $BM = \frac{3}{4}BC$ .

$$\vec{AB} = \mathbf{s} \text{ and } \vec{AC} = \mathbf{t}$$



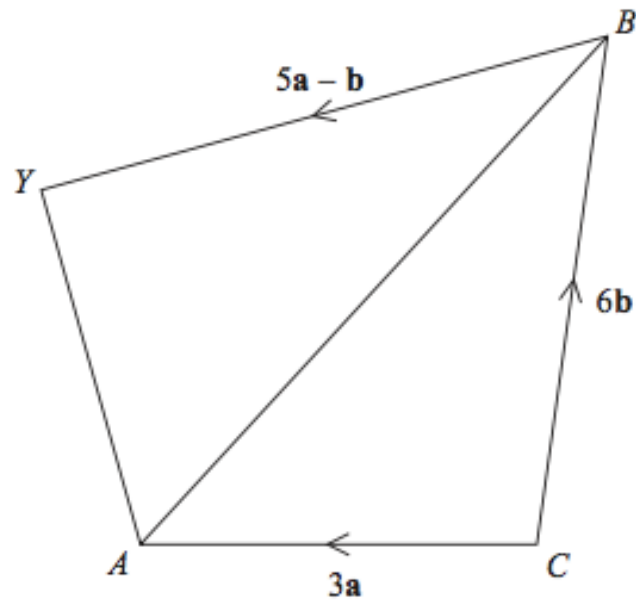
Not drawn accurately

Find  $\vec{AM}$  in terms of  $\mathbf{s}$  and  $\mathbf{t}$ .

Give your answer in its simplest form.

(Total 3 marks)

5.



$CAYB$  is a quadrilateral.

$$\vec{CA} = 3\mathbf{a}$$

$$\vec{CB} = 6\mathbf{b}$$

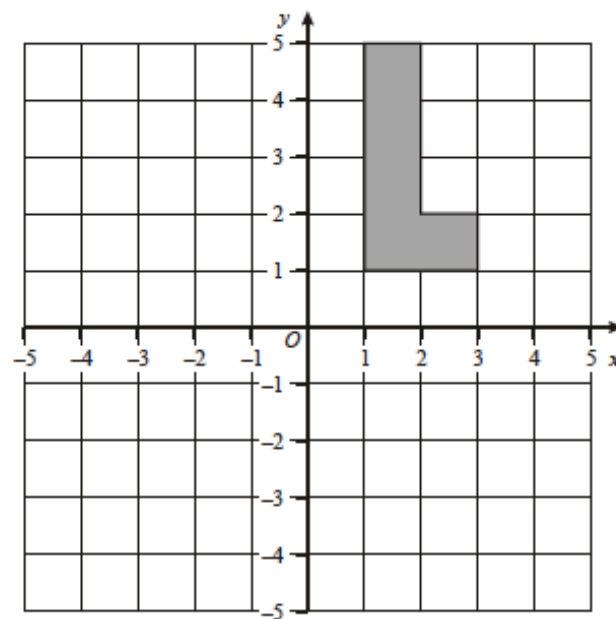
$$\vec{BY} = 5\mathbf{a} - \mathbf{b}$$

$X$  is the point on  $AB$  such that  $AX:XB = 1:2$

Prove that  $\vec{CX} = \frac{2}{5}\vec{CY}$

(Total 5 marks)

6.

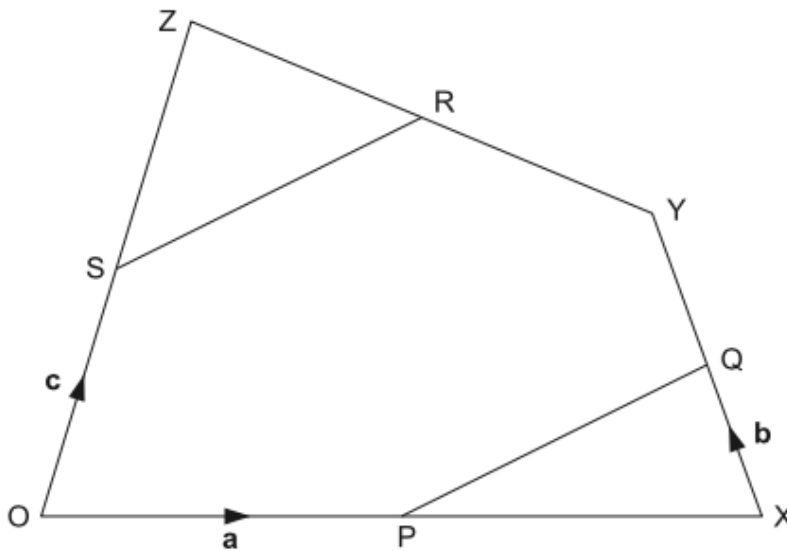


Draw the diagram in your book. Enlarge the shaded shape by scale factor  $-\frac{1}{2}$  with centre of enlargement  $(-1, 0)$ .

(Total 2 marks)

7.

P, Q, R and S are the midpoints of OX, XY, YZ and OZ respectively.



$\vec{OP} = \mathbf{a}$ ,  $\vec{XQ} = \mathbf{b}$  and  $\vec{OS} = \mathbf{c}$ .

Show that PQ is parallel to SR.

[5]

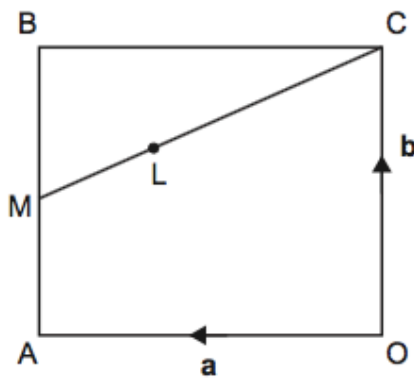
8.

OABC is a square.

$\vec{OA} = \mathbf{a}$  and  $\vec{OC} = \mathbf{b}$ .

M is the midpoint of AB.

L is a point on MC such that  $LC = 2ML$ .



Not to scale

Use vectors to prove that point L lies on the line OB.

[5]