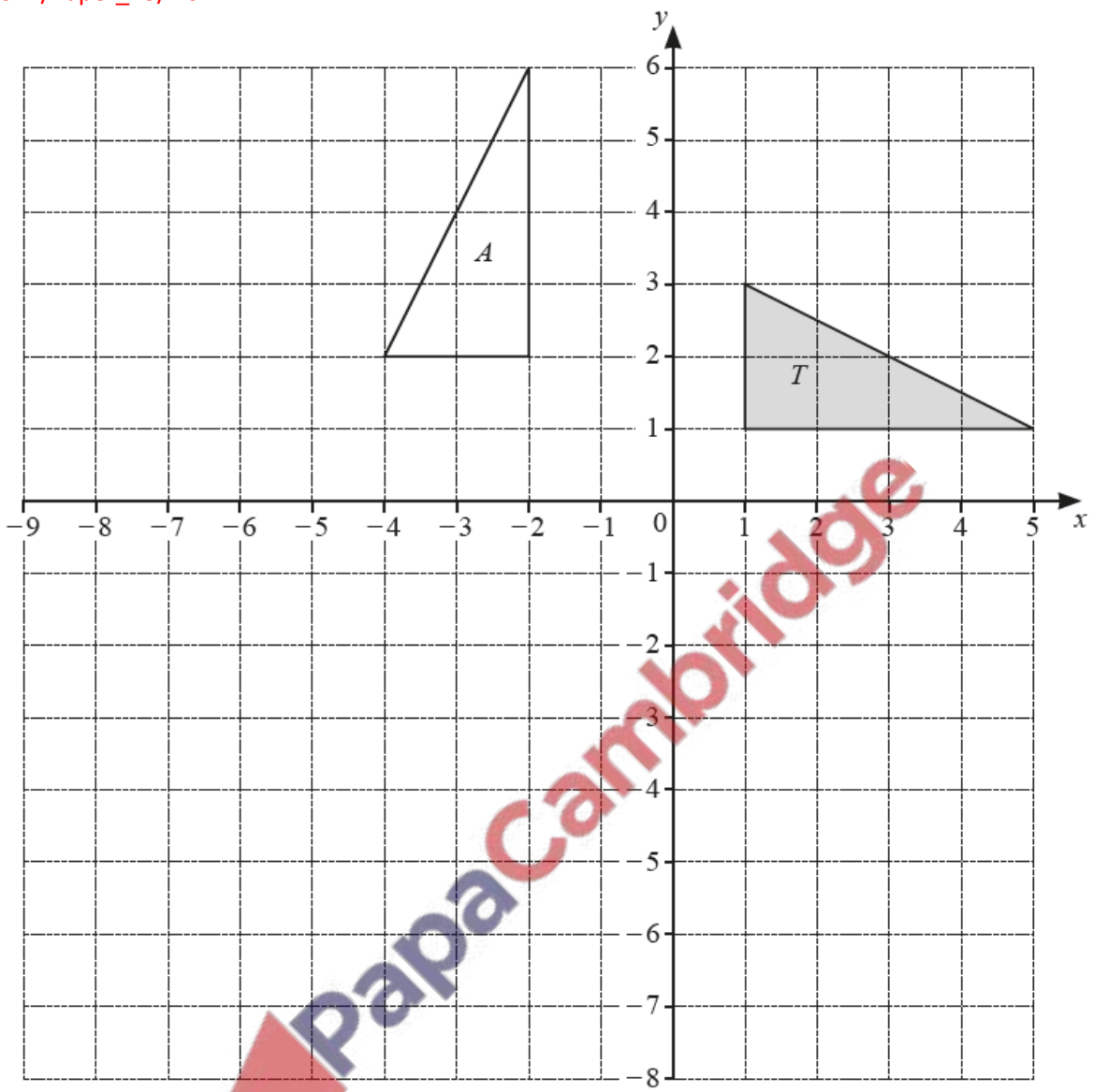
Transformations and Vectors – 2022 Nov IGCSE 0444 Math

1. Nov/2022/Paper_43/No.1



(a) Draw the reflection of triangle T in the line $y = -2$. [2]

(b) Draw the enlargement of triangle T with scale factor $\frac{1}{2}$ and center of enlargement $(-5, -3)$. [2]

(c) Describe fully the **single** transformation that maps triangle T onto triangle A.

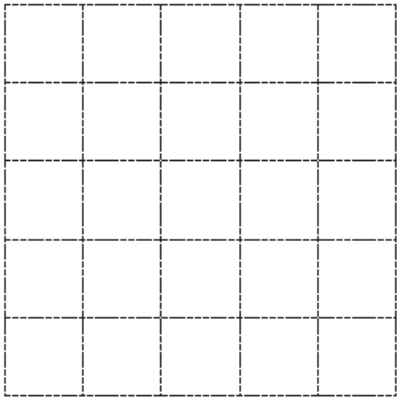
.....

..... [3]

2. Nov/2022/Paper_43/No.9

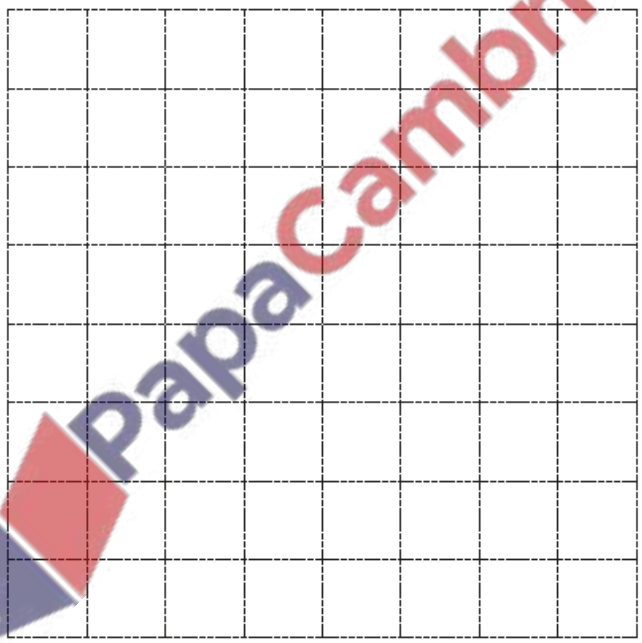
(a) $\mathbf{a} = \begin{pmatrix} 1 \\ 2 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} -3 \\ 5 \end{pmatrix}$

(i) On the grid, draw and label vector $2\mathbf{a}$.



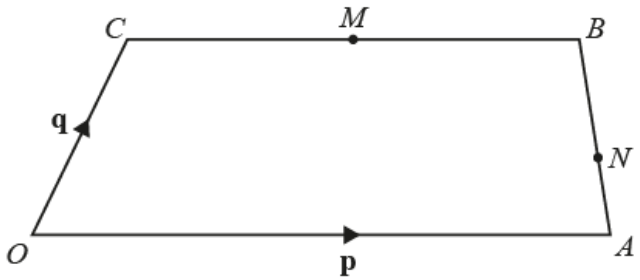
[1]

(ii) On the grid, draw and label vector $(\mathbf{a} - \mathbf{b})$.



[2]

(b)



NOT TO SCALE

$OABC$ is a trapezoid with OA parallel to CB.
M is the midpoint of CB and N is the point on AB such that $AN : NB = 1 : 2$.
O is the origin, $\overrightarrow{OA} = \mathbf{p}$, $\overrightarrow{OC} = \mathbf{q}$ and $\overrightarrow{CB} = \frac{3}{4}\mathbf{p}$.

(i) Find, in terms of **p** and/or **q**, in its simplest form

(a) $\overrightarrow{OB}$

$\overrightarrow{OB} =$ ..... [1]

(b) $\overrightarrow{AB}$

$\overrightarrow{AB} =$ ..... [2]

(c) $\overrightarrow{MN}$.

$\overrightarrow{MN} =$ ..... [3]

(ii) OA and MN are extended to meet at G.

Find the position vector of G in terms of **p**.

..... [2]