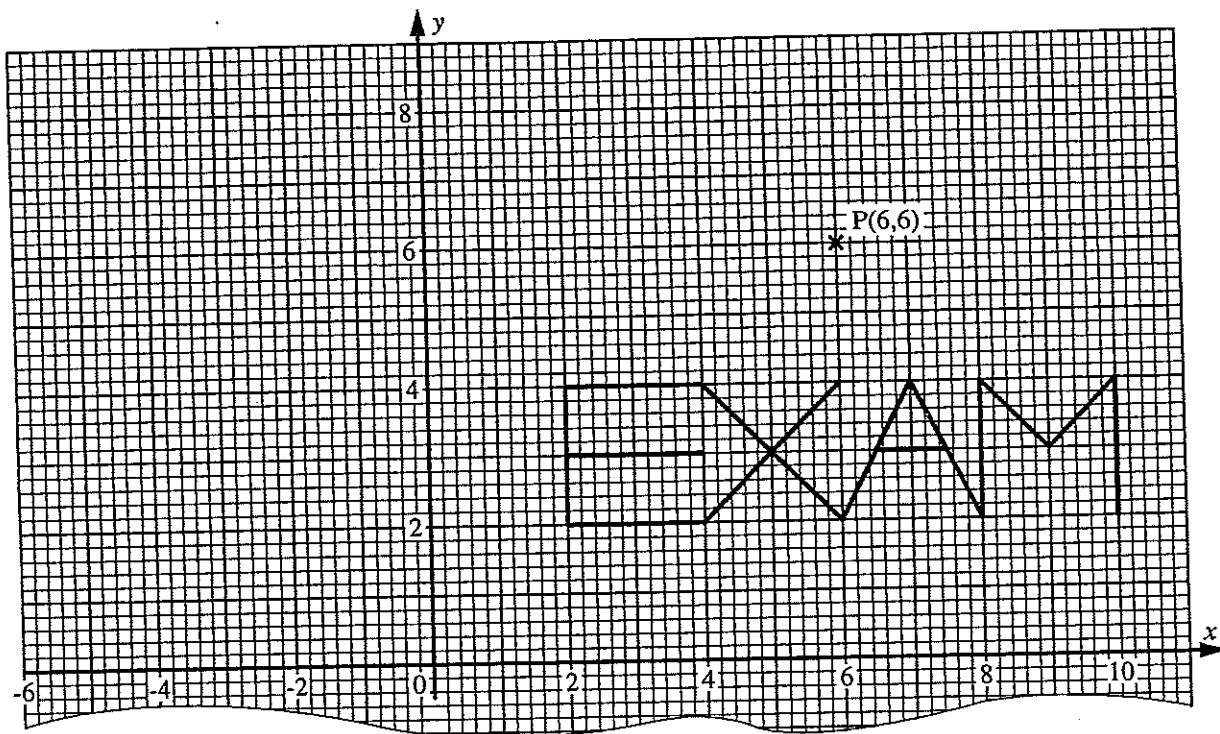


# IGCSE Transformations – 3

Oct 02 Paper 4

3



Answer the whole of this question on a sheet of graph paper.

- (a) Using a scale of 1 cm to represent 1 unit on each axis, draw an  $x$ -axis for  $-6 \leq x \leq 10$  and a  $y$ -axis for  $-8 \leq y \leq 8$ .  
Copy the word EXAM onto your grid so that it is exactly as it is in the diagram above.  
Mark the point  $P(6,6)$ . [2]
- (b) Draw accurately the following transformations. [2]
- Reflect the letter E in the line  $x = 0$ . [2]
  - Enlarge the letter X by scale factor 3 about centre  $P(6,6)$ . [2]
  - Rotate the letter A  $90^\circ$  anticlockwise about the origin. [2]
  - Stretch the letter M vertically with scale factor 2 and  $x$ -axis invariant. [2]
- (c) (i) Mark and label the point  $Q$  so that  $\overrightarrow{PQ} = \begin{pmatrix} -3 \\ 2 \end{pmatrix}$ . [1]
- (ii) Calculate  $|\overrightarrow{PQ}|$  correct to two decimal places. [2]
- (iii) Mark and label the point  $S$  so that  $\overrightarrow{PS} = \begin{pmatrix} -4 \\ -1 \end{pmatrix}$ . [1]
- (iv) Mark and label the point  $R$  so that  $PQRS$  is a parallelogram. [1]