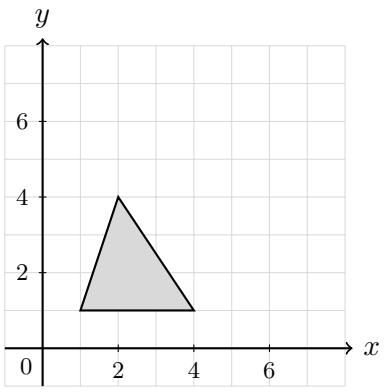
Foundation GCSE: Translation

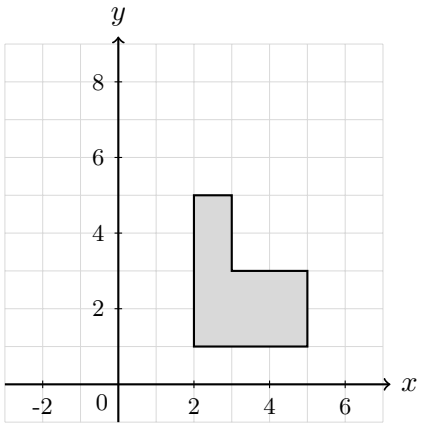
Name: _____ Class: _____

Instructions: Answer all questions. Each question features an accompanying grid diagram. Questions are ordered from easiest (1) to hardest (5). Working out should be shown where appropriate.

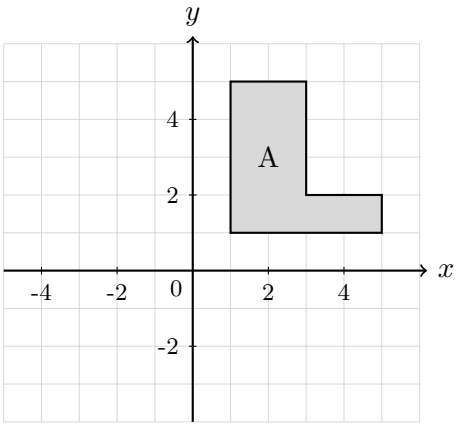
1. Translate the triangle by the vector $\begin{pmatrix}3\\2\end{pmatrix}$. State the coordinates of the vertices of the image.



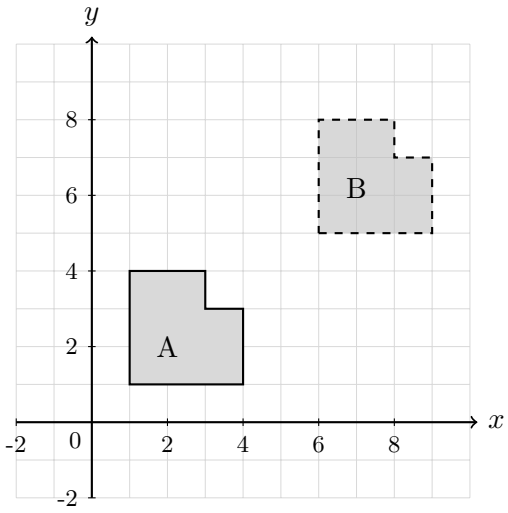
2. Translate the L-shape by the vector $\begin{pmatrix}-2\\4\end{pmatrix}$. State the coordinates of the vertices of the image.



3. Translate shape A by the vector $\begin{pmatrix}-4\\-3\end{pmatrix}$. State the coordinates of the vertices of the image.

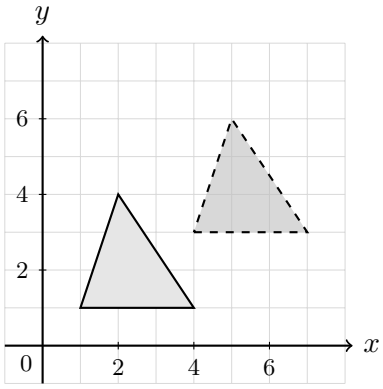


4. Describe fully the single transformation that maps shape A onto shape B.

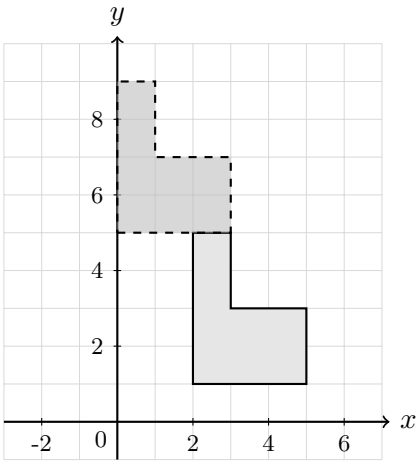


Answers & Worked Solutions

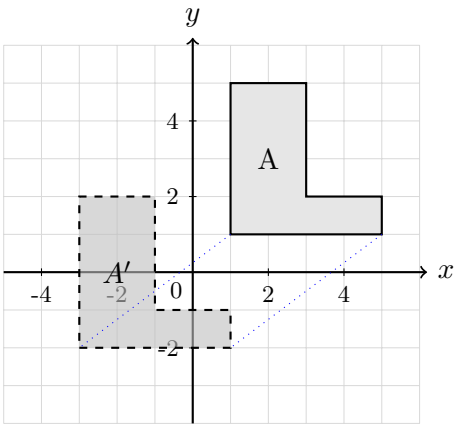
1. $(4,3)$, $(7,3)$, $(5,6)$: rule for translation by vector $\begin{pmatrix} a \\ b \end{pmatrix}$ is $(x,y) \to (x+a, y+b)$.



2. $(0,5)$, $(3,5)$, $(3,7)$, $(1,7)$, $(1,9)$, $(0,9)$: rule for translation by vector $\begin{pmatrix} a \\ b \end{pmatrix}$ is $(x,y) \to (x+a, y+b)$.



3. Translating any point (x,y) by the vector $\begin{pmatrix} -4 \\ -3 \end{pmatrix}$ maps it using $(x,y) \to (x-4, y-3)$: $(1,1) \to (-3,-2)$, $(5,1) \to (1,-2)$, $(5,2) \to (1,-1)$, $(3,2) \to (-1,-1)$, $(3,5) \to (-1,2)$, $(1,5) \to (-3,2)$



4. Translation by vector $\begin{pmatrix} 5 \\ 4 \end{pmatrix}$. *Explanation:* Comparing corresponding vertices (e.g., from $(1,1)$ on shape A to $(6,5)$ on shape B), the horizontal shift is $6-1=5$ and the vertical shift is $5-1=4$.