1 Use the words left, right, up or down, to complete these sentences.

    a The vector $\begin{bmatrix} 2 \\ 4 \end{bmatrix}$ means to move 2 units to the _____ and 4 units _____.

    b The vector $\begin{bmatrix} -5 \\ 6 \end{bmatrix}$ means to move 5 units to the _____ and 6 units _____.

    c The vector $\begin{bmatrix} 3 \\ -1 \end{bmatrix}$ means to move 3 units to the _____ and 1 unit _____.

    d The vector $\begin{bmatrix} -10 \\ -12 \end{bmatrix}$ means to move 10 units to the _____ and 12 units _____.

4 Copy and show on separate grids the position of A' after applying each of the following vector translations.
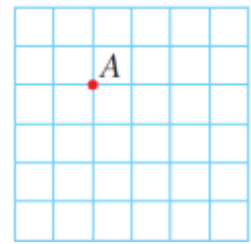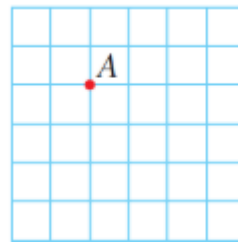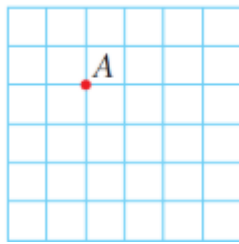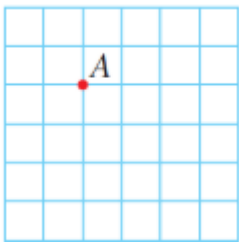
    a $\begin{bmatrix} 1 \\ -3 \end{bmatrix}$ **b** $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$ **c** $\begin{bmatrix} -1 \\ 2 \end{bmatrix}$ **d** $\begin{bmatrix} 0 \\ -2 \end{bmatrix}$

5 Write the vector that takes each point to its image. Use a grid to help you.
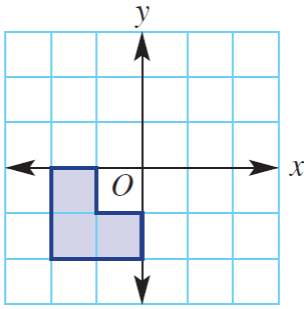
    a $A(2, 3)$ to $A'(3, 2)$

    b $B(1, 4)$ to $B'(4, 3)$

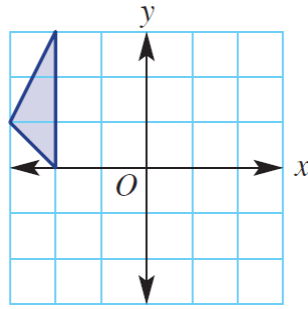   **c** $C(-2, 4)$ to $C'(0, 2)$

    d $D(-3, 1)$ to $D'(-1, -3)$

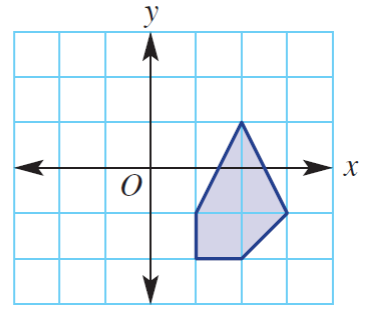**6** Copy the diagrams and draw the image of the shapes translated by the given vectors.

a $\begin{bmatrix} 2 \\ 3 \end{bmatrix}$

b $\begin{bmatrix} 4 \\ -2 \end{bmatrix}$

c $\begin{bmatrix} -3 \\ 1 \end{bmatrix}$

8 Which vector from each set takes an object the greatest distance from its original position? You may need to draw diagrams to help, but you should not need to calculate distances.

a $\begin{bmatrix} -1 \\ 3 \end{bmatrix}, \begin{bmatrix} 0 \\ 3 \end{bmatrix}, \begin{bmatrix} 7 \\ 0 \end{bmatrix}$

b $\begin{bmatrix} -1 \\ -4 \end{bmatrix}, \begin{bmatrix} 4 \\ 0 \end{bmatrix}, \begin{bmatrix} 0 \\ 3 \end{bmatrix}$