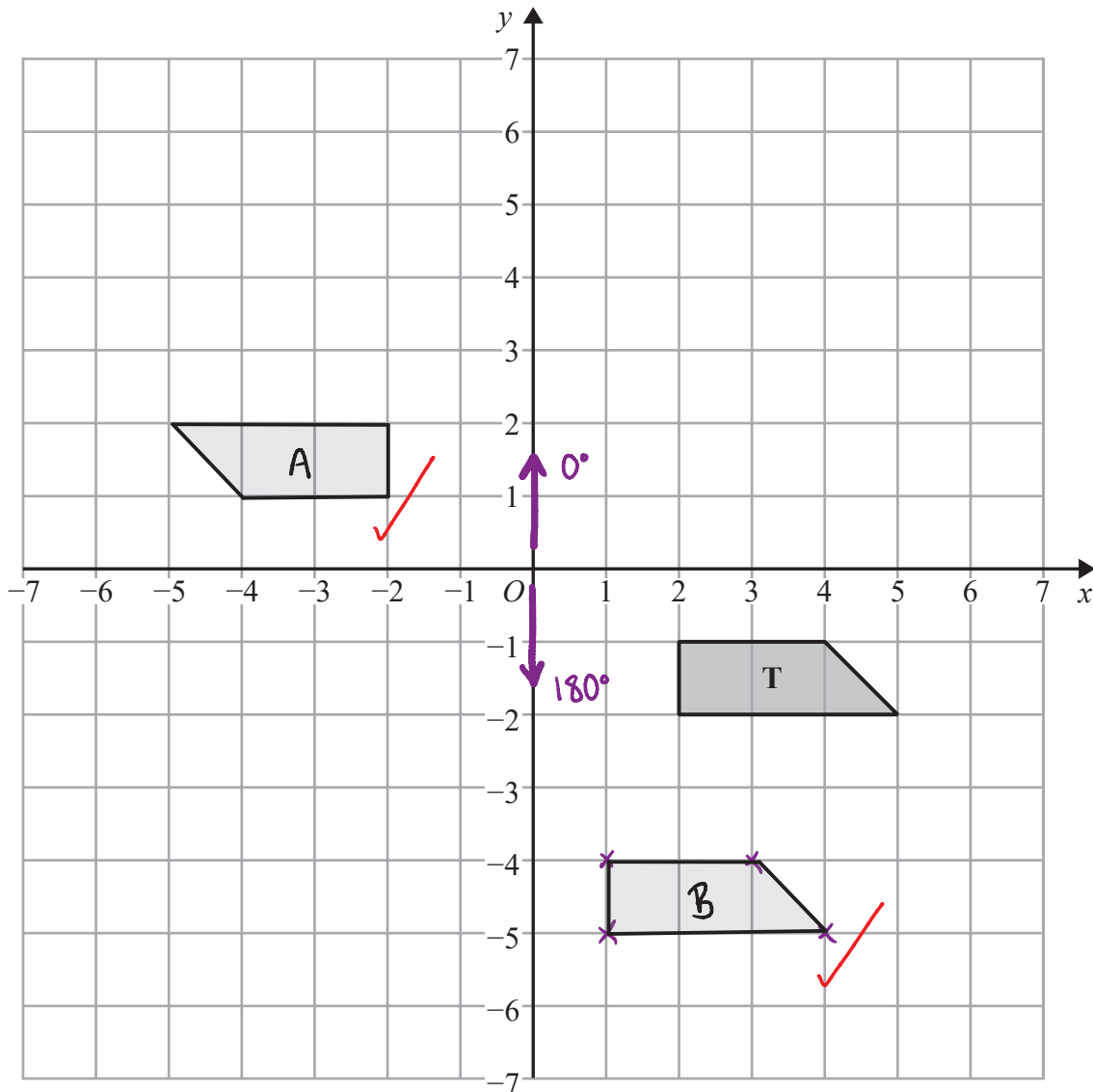


1.



- (a) Rotate trapezium **T**  $180^\circ$  about the origin.  
Label the new trapezium **A**.

(1)

- (b) Translate trapezium **T** by the vector  $\begin{pmatrix} -1 \\ -3 \end{pmatrix}$   
Label the new trapezium **B**.

(1)

(Total for Question is 2 marks)

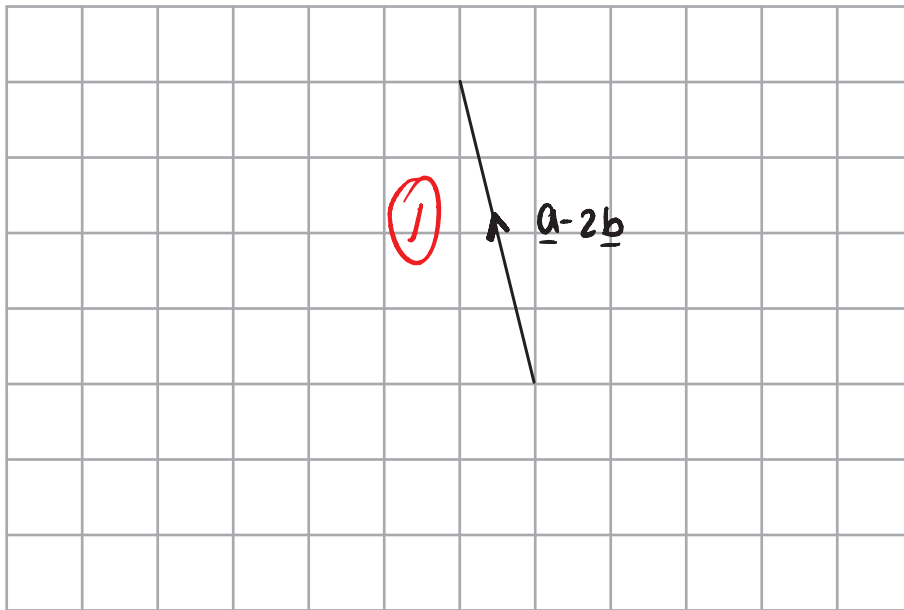
2. Here are two column vectors.

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

On the grid below, draw and label the vector  $\mathbf{a} - 2\mathbf{b}$

$$\underline{\mathbf{a}} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} \quad 2\underline{\mathbf{b}} = 2 \begin{pmatrix} 3 \\ -1 \end{pmatrix} = \begin{pmatrix} 2 \times 3 \\ 2 \times -1 \end{pmatrix} = \begin{pmatrix} 6 \\ -2 \end{pmatrix}$$

$$\therefore \underline{\mathbf{a}} - 2\underline{\mathbf{b}} = \begin{pmatrix} 5 \\ 2 \end{pmatrix} - \begin{pmatrix} 6 \\ -2 \end{pmatrix} = \begin{pmatrix} 5-6 \\ 2-(-2) \end{pmatrix} = \begin{pmatrix} -1 \\ 4 \end{pmatrix}$$



3.  $\mathbf{a} = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$        $\mathbf{b} = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$

Find  $2\mathbf{a} - 3\mathbf{b}$  as a column vector.

$$2 \begin{pmatrix} 3 \\ 4 \end{pmatrix} - 3 \begin{pmatrix} 5 \\ -2 \end{pmatrix}$$

$$\begin{pmatrix} 6 \\ 8 \end{pmatrix} - \begin{pmatrix} 15 \\ -6 \end{pmatrix} = \begin{pmatrix} -9 \\ 14 \end{pmatrix} \checkmark_1 \checkmark_2$$

$$\begin{pmatrix} a \\ b \end{pmatrix} + \begin{pmatrix} c \\ d \end{pmatrix} = \begin{pmatrix} a+c \\ b+d \end{pmatrix}$$

$$k \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} kx \\ ky \end{pmatrix}$$

$$\begin{pmatrix} -9 \\ \dots \\ 14 \end{pmatrix}$$

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(Total for Question is 2 marks)