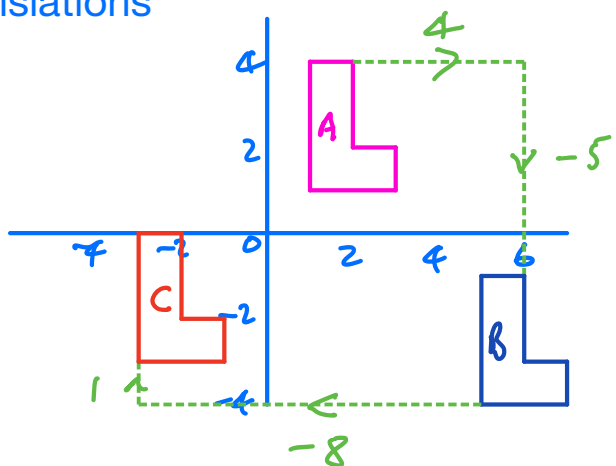# Transformations - Translations, Reflections, Rotations, Enlargements

Translations

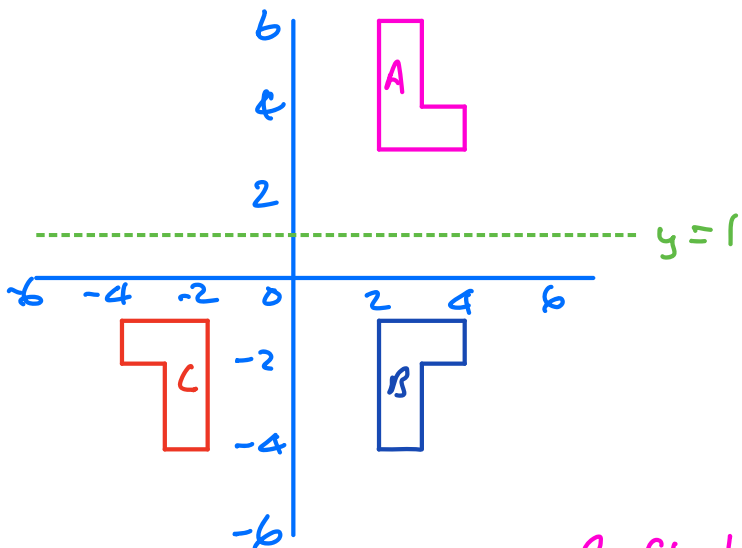Translate A by $\begin{pmatrix} 4 \\ -5 \end{pmatrix}$ to give B

Translate B by $\begin{pmatrix} -8 \\ 1 \end{pmatrix}$ to give C

Describe the transformation required to map C back to A.

Translate by $\begin{pmatrix} 4 \\ 4 \end{pmatrix}$

Translate by $\begin{pmatrix} x \\ y \end{pmatrix}$ means move x in the x-direction and y in the y-direction. It is called a column vector.
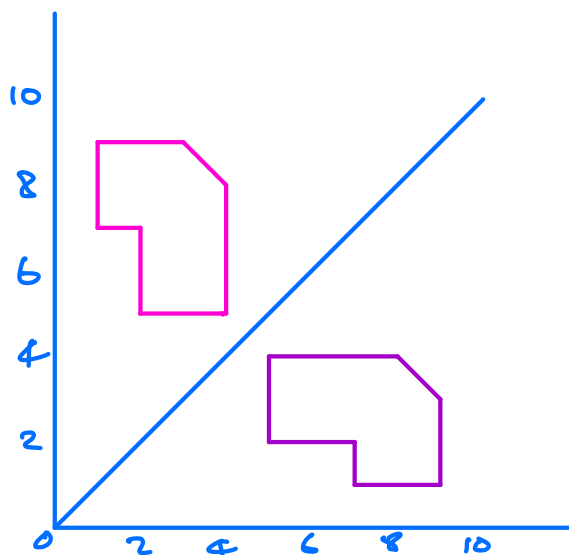

Reflections

Reflect A in line $y=1$ to give B

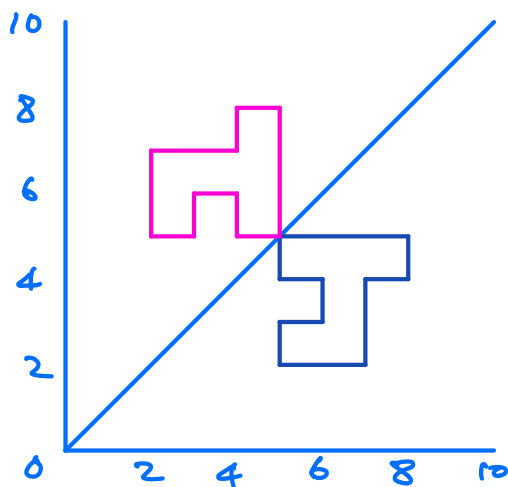Reflect B in y-axis to give C

Reflect in Line $y=x$

$(x, y) \rightarrow (y, x)$

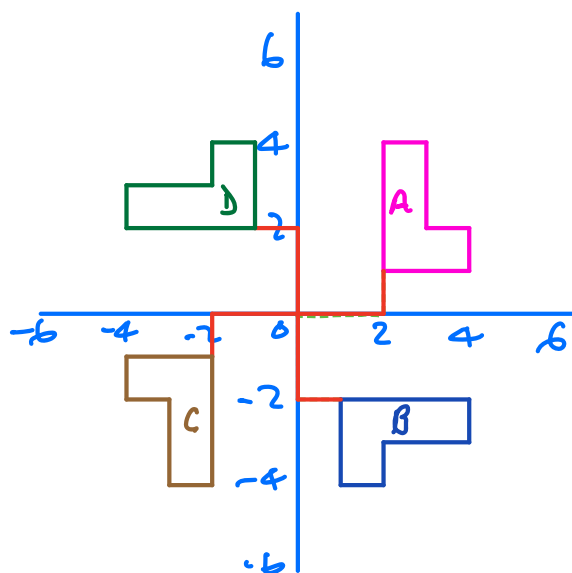For each point the coordinates are reversed.
Vertical lines become horizontal
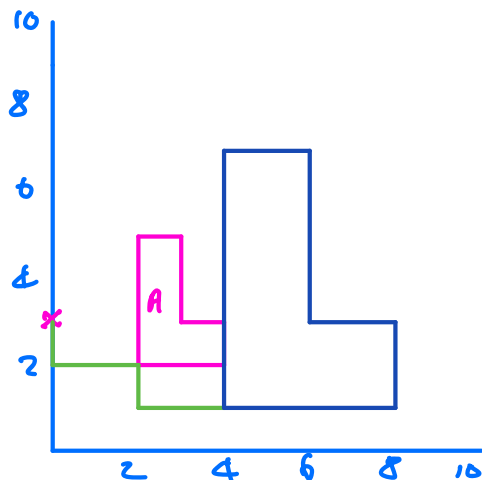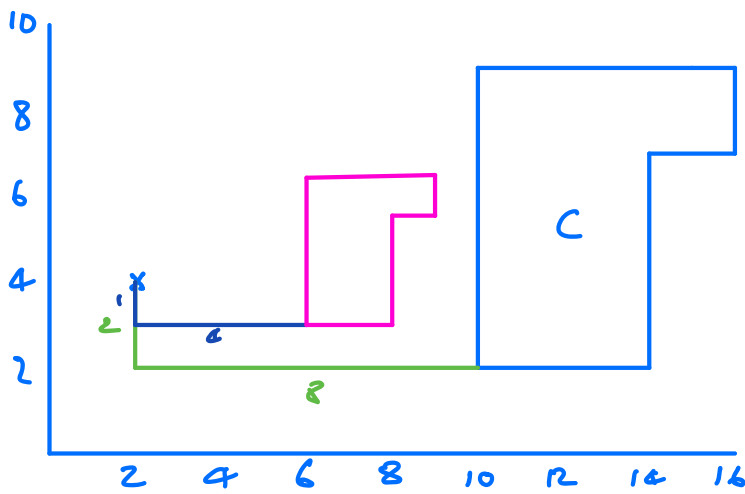Horizontal lines become vertical

Example 2

Rotations

Rotate A 90° clockwise about (0,0) to give B

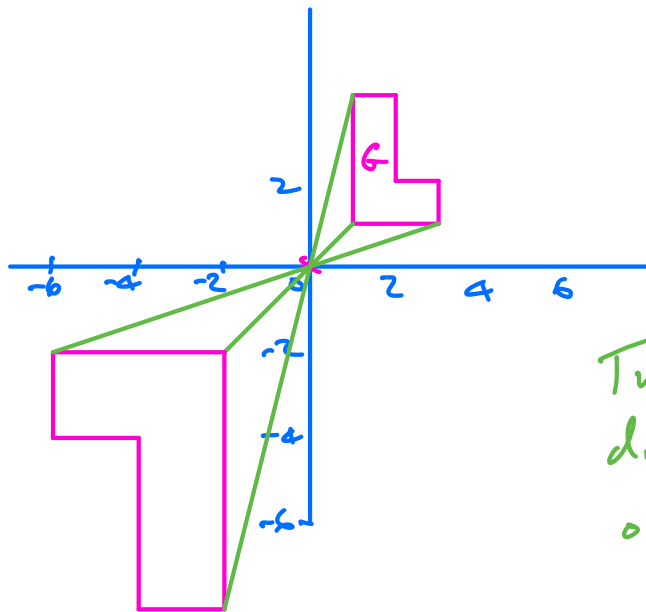A is mapped to C by a rotation of 180° about (0,0)

Enlargements

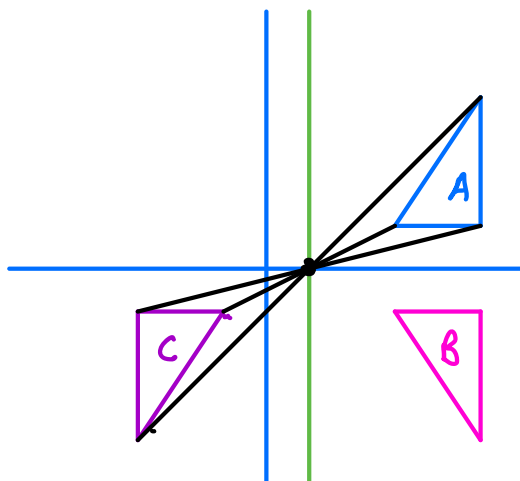Enlarge A by scale factor 2 about centre of enlargement (0,3)

Enlarge C
by scale factor $\frac{1}{2}$
about $(2,4)$

Negative Scale Factors

Enlarge G by
scale factor -2
about $(0,0)$

Twice as far in opposite
direction from centre
of enlargement

Rotation by $180°$
about $(1,0)$

OR

Enlargement by
scale factor -1
about $(1,0)$