Linear transformation

A *linear transformation* is a geometric transformation made of a combination of any or all of:

- rotations centred on the origin
- reflections about lines through the origin
- scalings centred on the origin (for example, a stretch in the x-direction).

Enlargements and shears are examples of linear transformations, as they can be produced by a combination of the above basic types.

Linear transformations can be represented using matrices. Each linear transformation corresponds to a matrix, and the image of each point is obtained by multiplying this matrix by the position vector of the point. For example, in 2 dimensions, a rotation of $90°$ corresponds to the matrix $\begin{pmatrix} 0 & -1 \\ 1 & 0 \end{pmatrix}$.