Matrices used for Transformations

Transformation (mapping)	Rule	Matrix
Reflection in *x*-axis	$x' = x$ $y' = -y$	$\begin{bmatrix}1 & 0\\0 & -1\end{bmatrix} \times \begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}x'\\y'\end{bmatrix}$
Reflection in *y*-axis	$x' = -x$ $y' = y$	$\begin{bmatrix}-1 & 0\\0 & 1\end{bmatrix} \times \begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}x'\\y'\end{bmatrix}$
Dilation factor *k* from *y*-axis	$x' = k\,x$ $y' = y$	$\begin{bmatrix}k & 0\\0 & 1\end{bmatrix} \times \begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}x'\\y'\end{bmatrix}$
Dilation factor *k* from *x*-axis	$x' = x$ $y' = k\,y$	$\begin{bmatrix}1 & 0\\0 & k\end{bmatrix} \times \begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}x'\\y'\end{bmatrix}$
Reflection in the line $y = x$	$x' = y$ $y' = x$	$\begin{bmatrix}0 & 1\\1 & 0\end{bmatrix} \times \begin{bmatrix}x\\y\end{bmatrix} = \begin{bmatrix}x'\\y'\end{bmatrix}$
Translation	$x' = x + a$ $y' = y + b$	$\begin{bmatrix}x\\y\end{bmatrix} + \begin{bmatrix}a\\b\end{bmatrix} = \begin{bmatrix}x'\\y'\end{bmatrix}$