**Combining Matrices**

Using the matrices below, which can you combine and in what order, to make the following transformations?

* Rotation of 180
* Identity
* Reflection in the *y*-axis
* Reflection in the line *y* = −*x*

Which can you make in more than one way?

Justify your answers using matrix multiplication.

|  |  |  |  |
| --- | --- | --- | --- |
| $$\left(\begin{matrix}1&0\\0&-1\end{matrix}\right)$$ | $$\left(\begin{matrix}0&1\\-1&0\end{matrix}\right)$$ | $$\left(\begin{matrix}0&-1\\1&0\end{matrix}\right)$$ | $$\left(\begin{matrix}0&1\\1&0\end{matrix}\right)$$ |
| Reflect in x | Rotate 90, clock | Rotate 90, anti | Reflect y=x |

(Transformations in white text underneath matrices. Highlight then change font colour to see them)