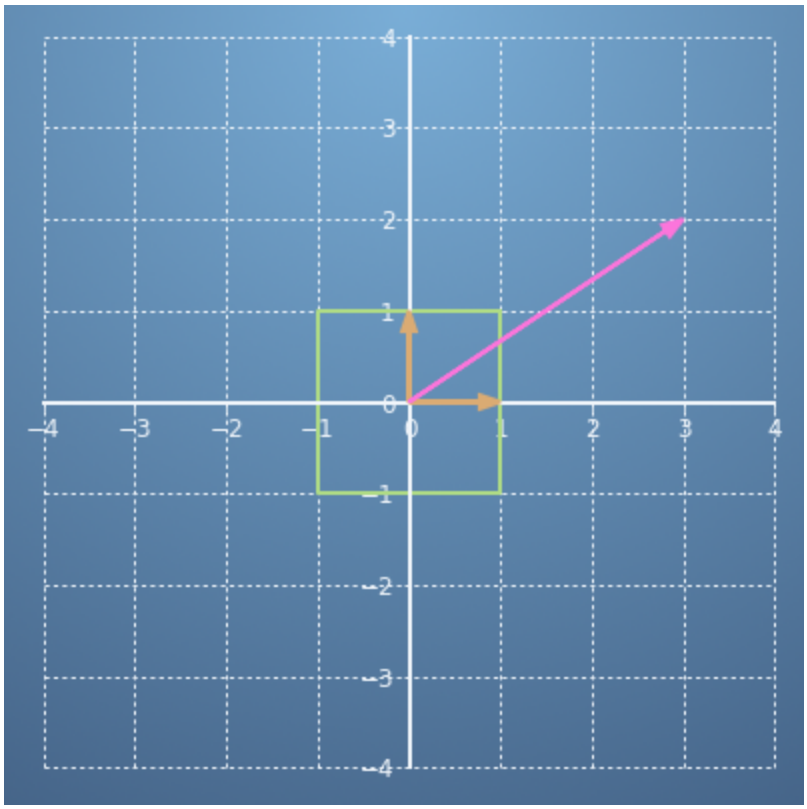
1. Matrices make transformations on vectors, potentially changing their magnitude and direction. 1 point

If we have two unit vectors (in orange) and another vector, $\mathbf{r} = \begin{bmatrix} 3 \\ 2 \end{bmatrix}$ (in pink), before any transformations - these look like this:



Take the matrix, $A = \begin{bmatrix} 1/2 & -1 \\ 0 & 3/4 \end{bmatrix}$, see how it transforms the unit vectors and the vector, $\mathbf{r}$,