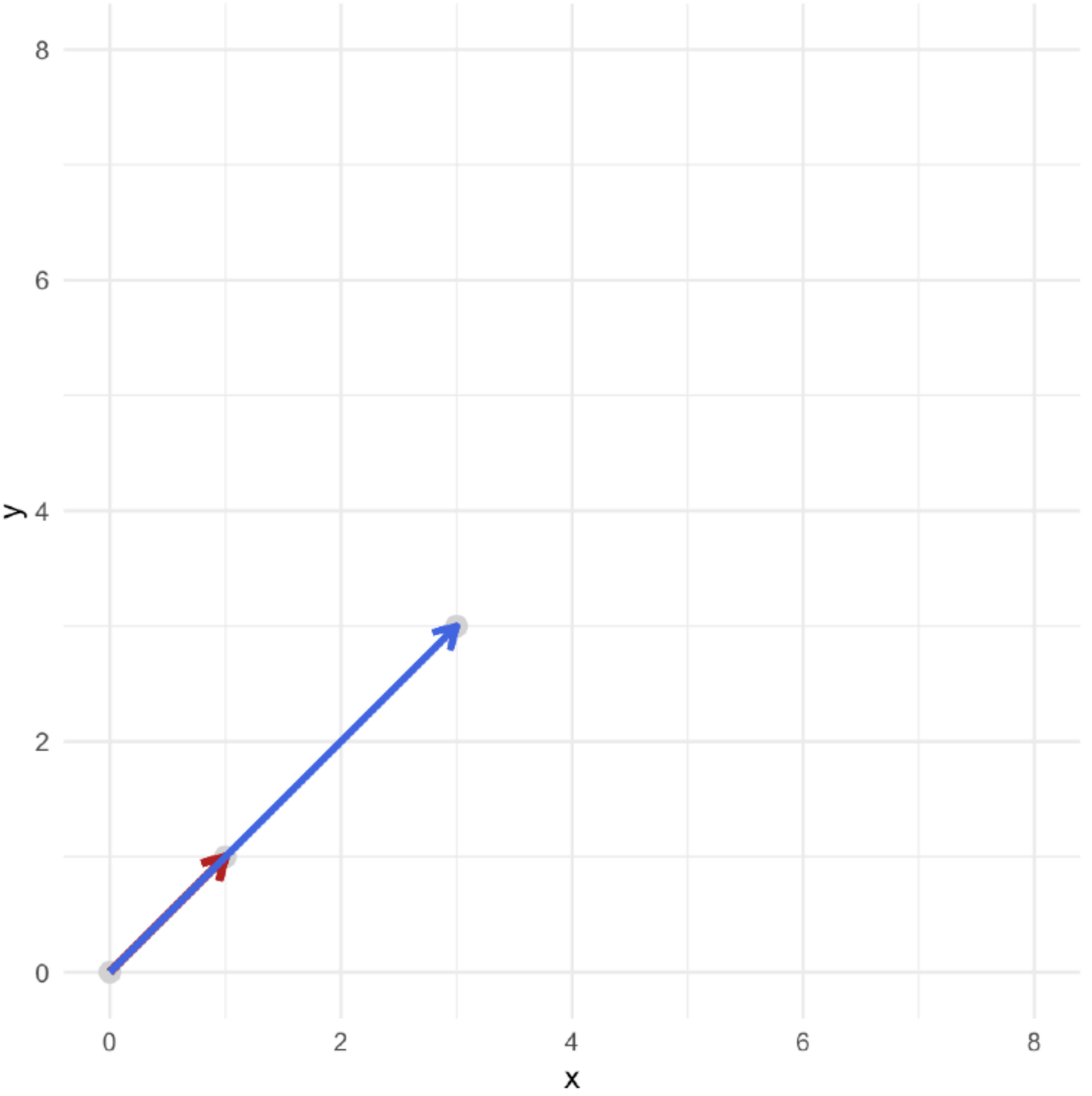

8
6
4
2
0
y
0
2
4
6
8
x

Eigendecomposition

For a given square matrix A, there are **special vectors** which refuse to stray from their path

$$A == \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$$

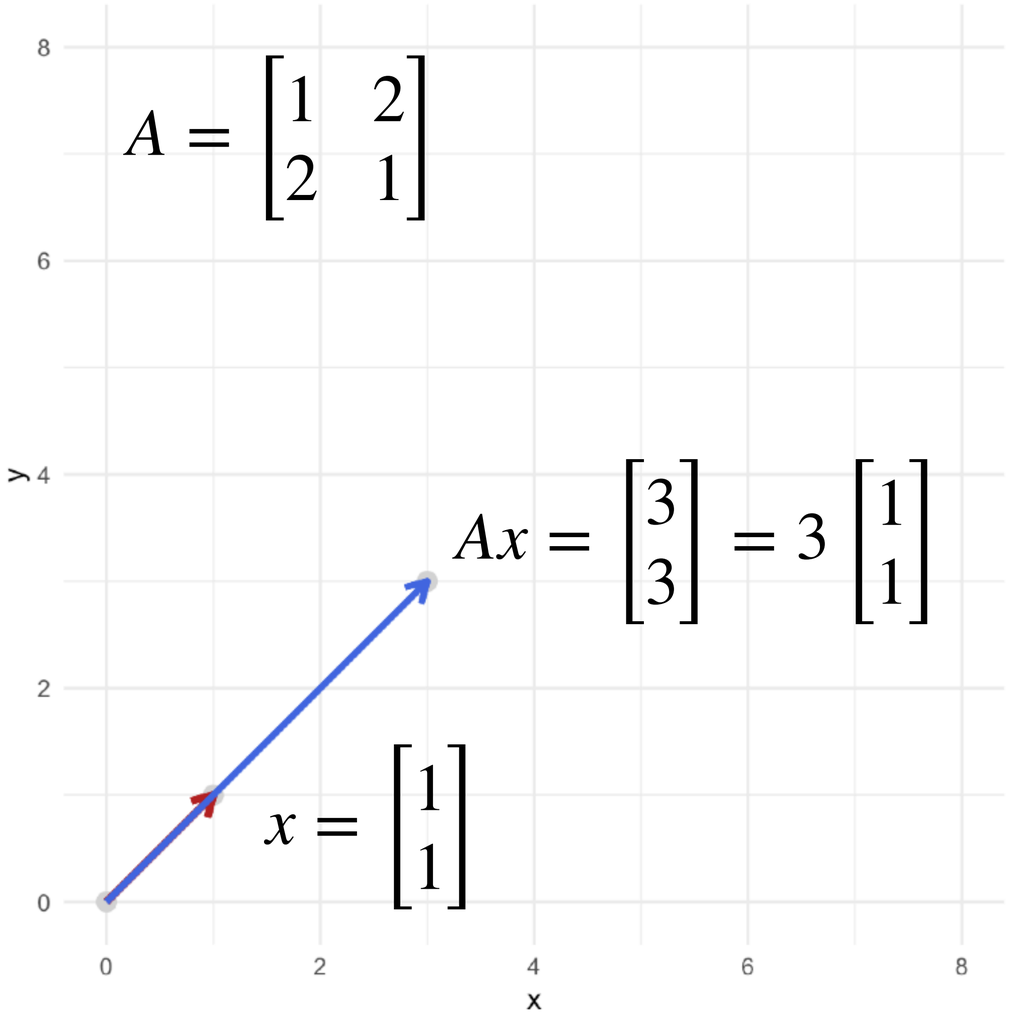
$$x == \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$Ax = \begin{bmatrix} 3 \\ 3 \end{bmatrix} = 3 \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

These vectors are called **eigenvectors**

Eigendecomposition

$$A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$$



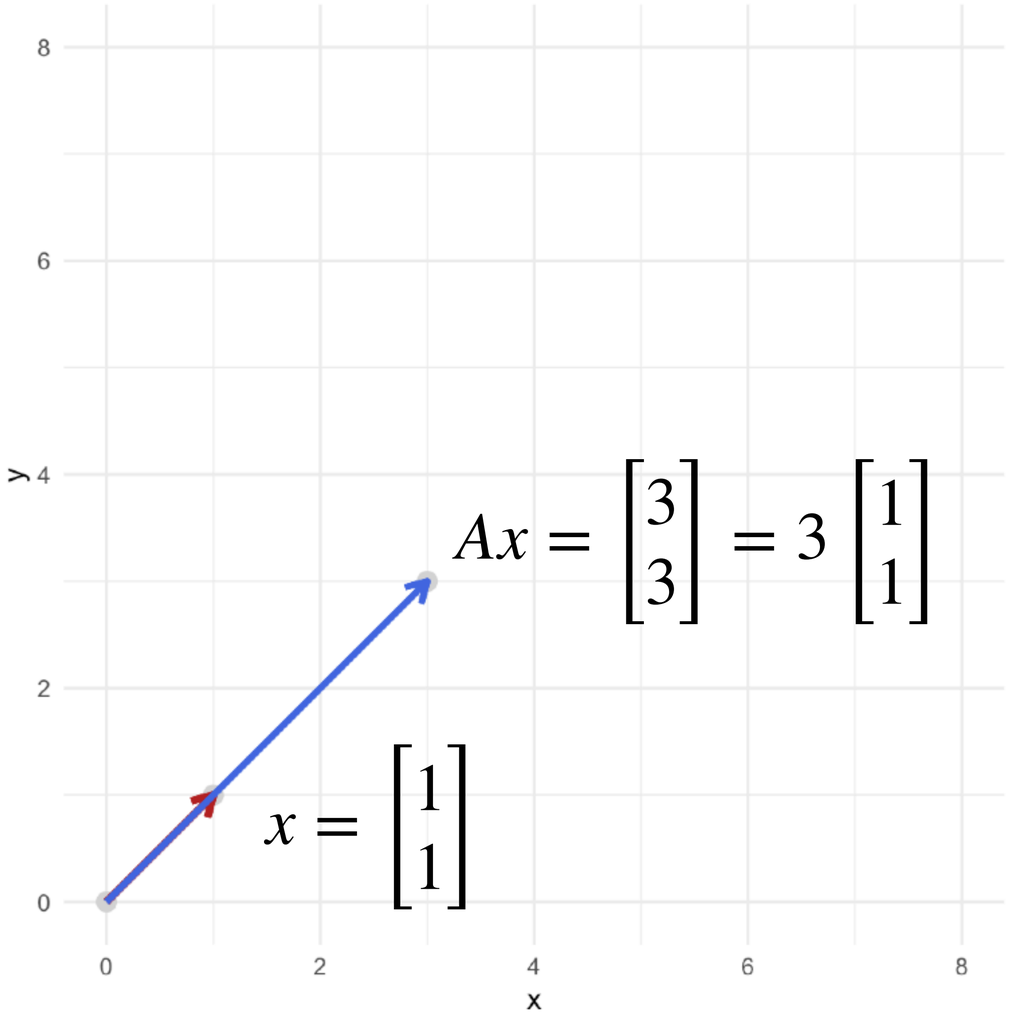
$$Ax = \begin{bmatrix} 3 \\ 3 \end{bmatrix} = 3 \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

$$x = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$$

For a given square matrix A, there are **special vectors** which refuse to stray from their path

These vectors are called **eigenvectors**

Eigendecomposition



For a given square matrix A, there are **special vectors** which refuse to stray from their path

These vectors are called **eigenvectors**

Formally, $Ax = \lambda x$

where λ are the eigenvalues determining the scale, but directions remains the same (x)

Several properties of matrices can be analyzed based on their eigenvalues.