

# Diagonalization

Consider the following 2 by 2 matrix:

$$A = \begin{pmatrix} 1 & 6 \\ 5 & 2 \end{pmatrix}$$

The linear transformation associated to this matrix has a simple description as follows:  
If we take the ordered basis of coordinate 2 – space given by the vectors

$$\begin{pmatrix} 1 \\ 1 \end{pmatrix} \begin{pmatrix} 6 \\ -5 \end{pmatrix}$$

then left multiplication by the matrix sends the first basis vector into 7 times itself, and it sends the second basis vector into  $-4$  times itself.

