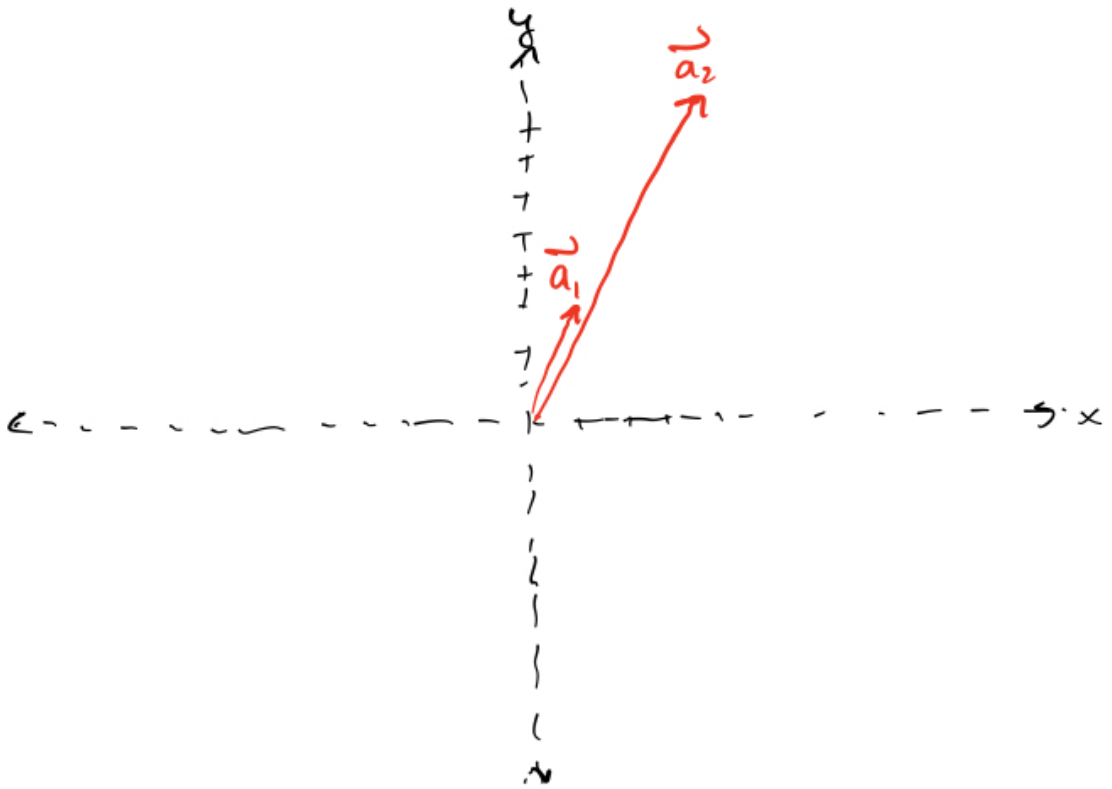
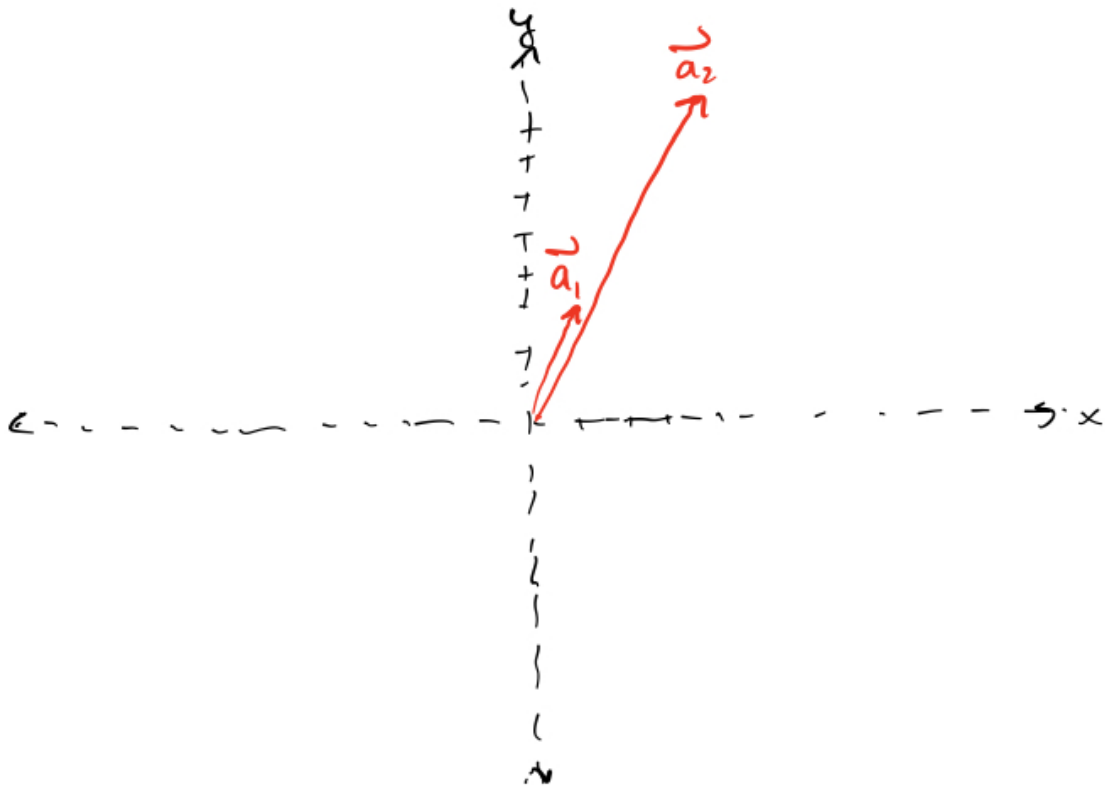
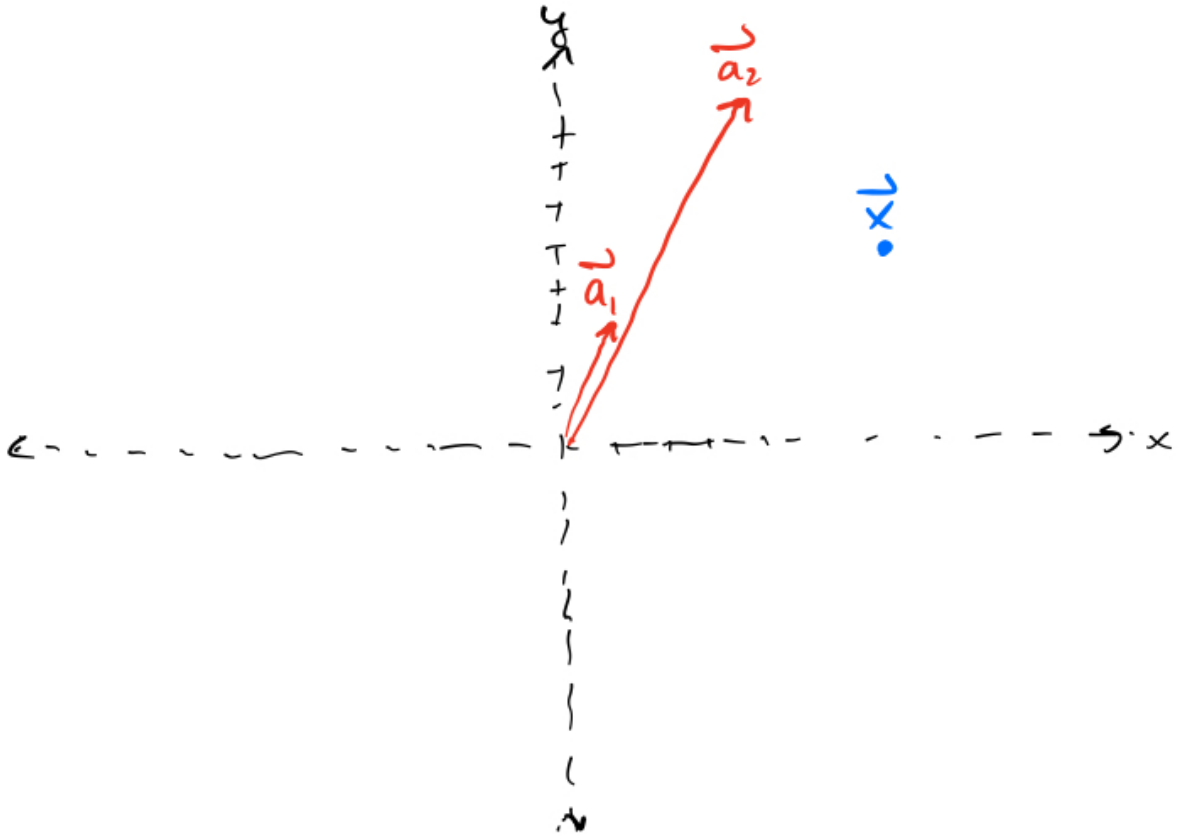
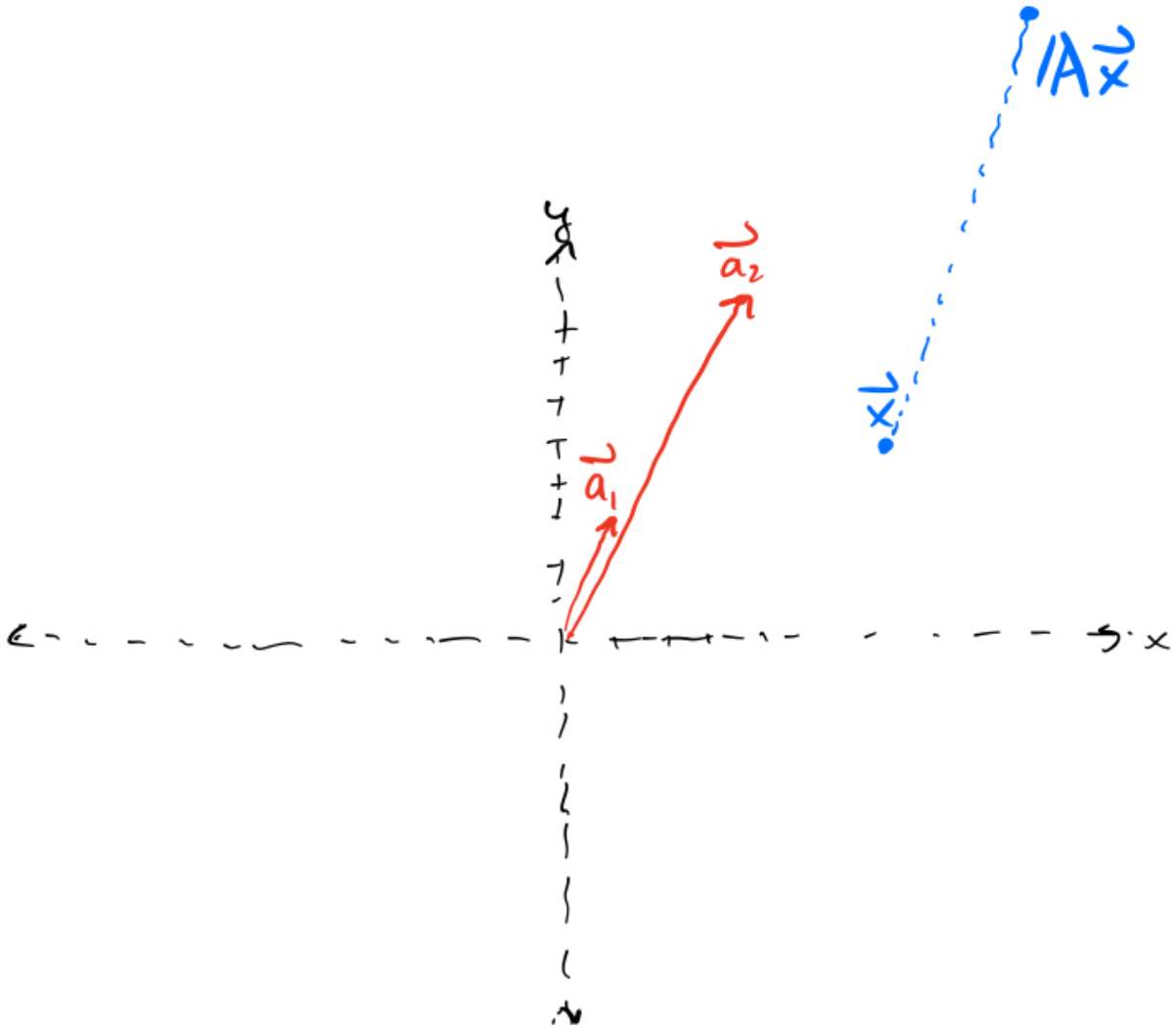
Singular Value Decomposition

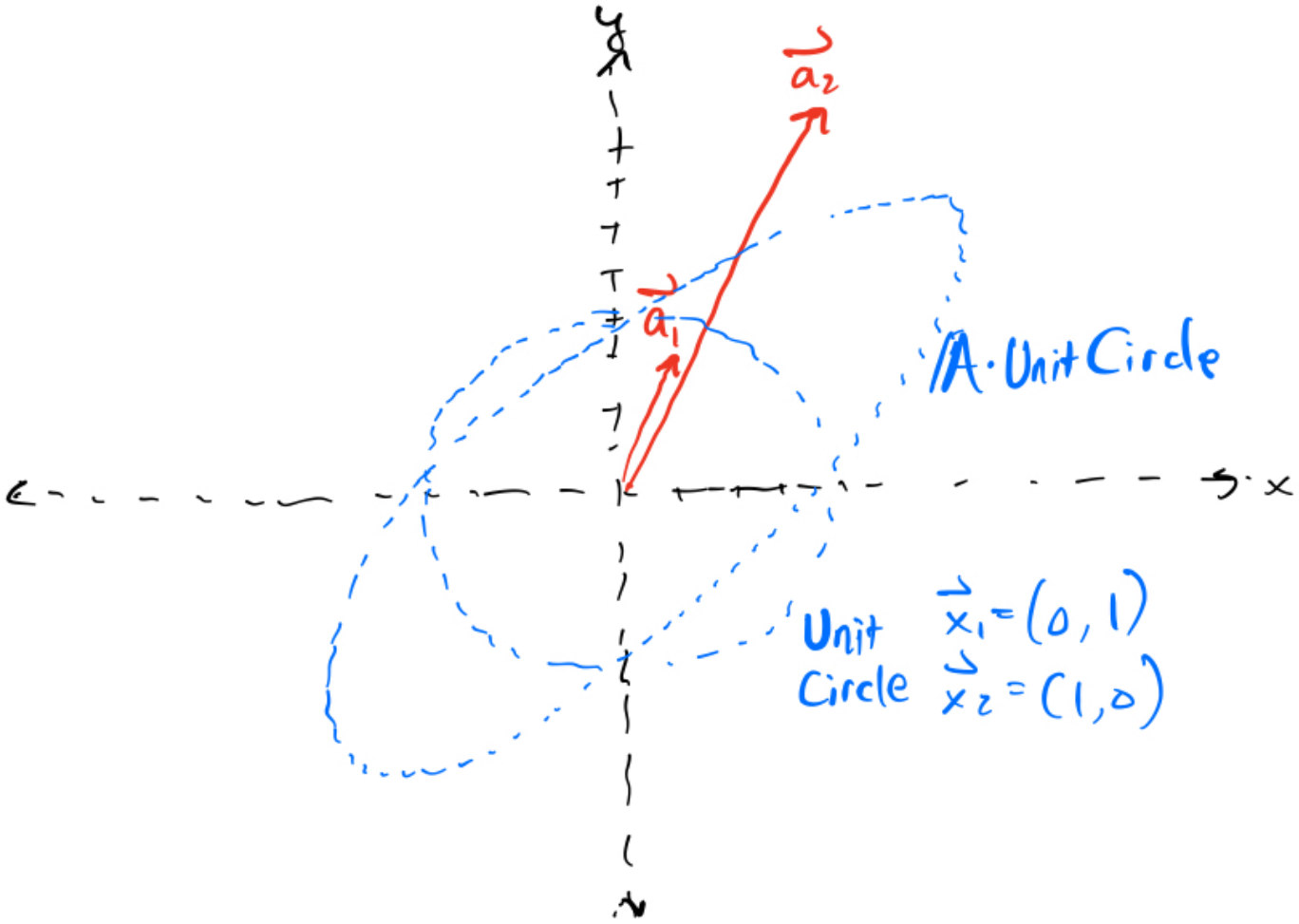
$$A = \begin{bmatrix} 0.5 & 1.5 \\ 2 & 3 \end{bmatrix} = \begin{bmatrix} \vec{a}_1 \\ \vec{a}_2 \end{bmatrix}$$



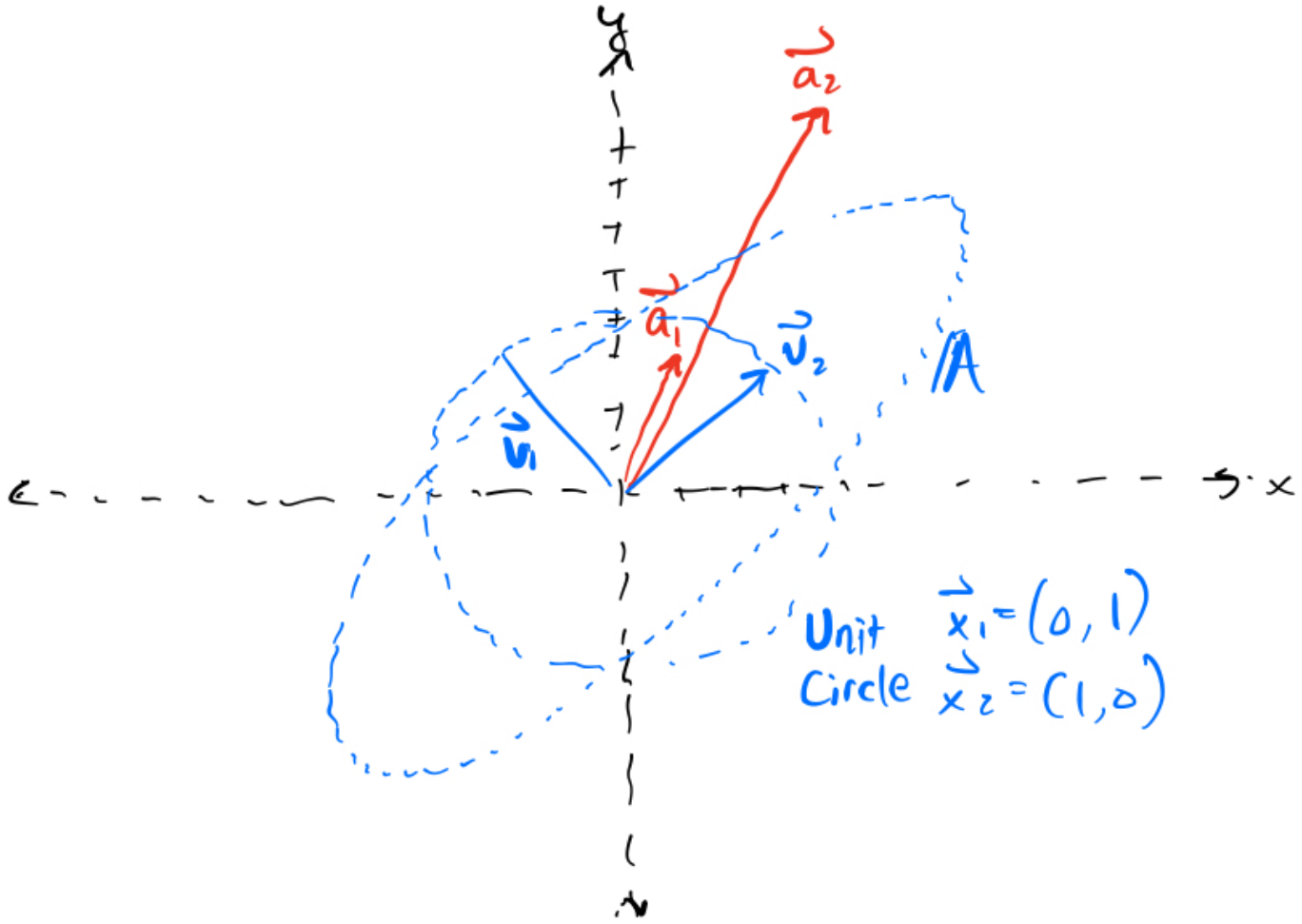

$\vec{a}_2$
$\vec{a}_1$


$\vec{a}_2$
$\vec{x}$
$\vec{a}_1$
x

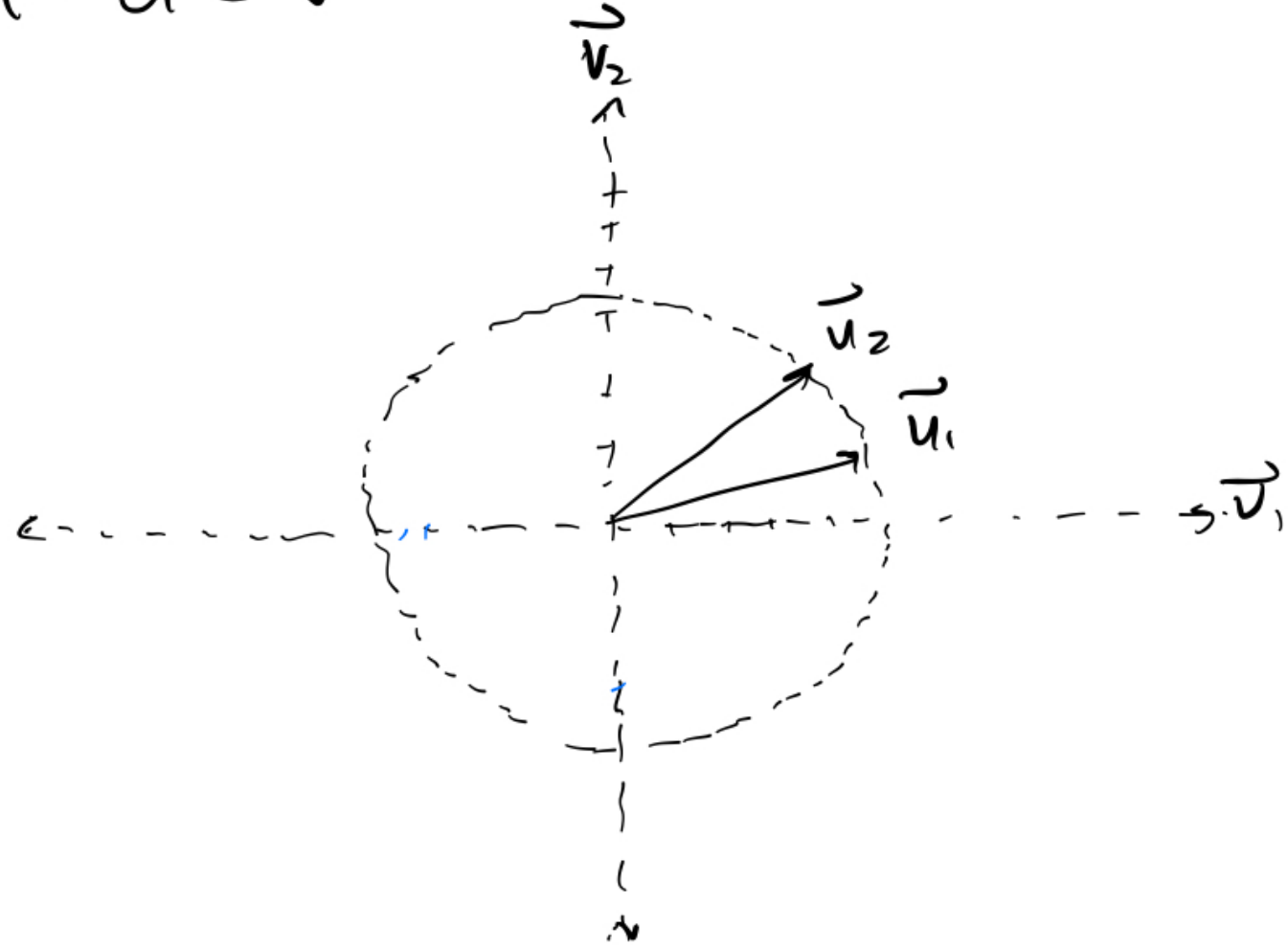

$A\vec{x}$
$\vec{x}$
$\vec{a}_2$
$\vec{a}_1$

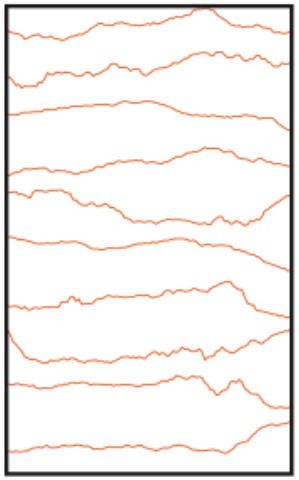

$\vec{a}_2$
$\vec{a}_1$
A · Unit Circle
Unit Circle
$\vec{x}_1 = (0, 1)$
$\vec{x}_2 = (1, 0)$

$$A = U \Sigma V^T$$

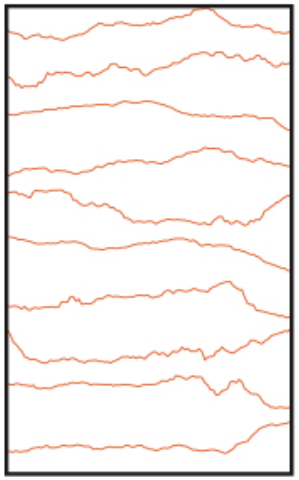


$$A = U \Sigma V^T$$

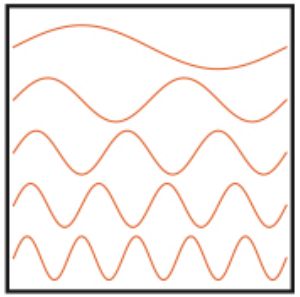




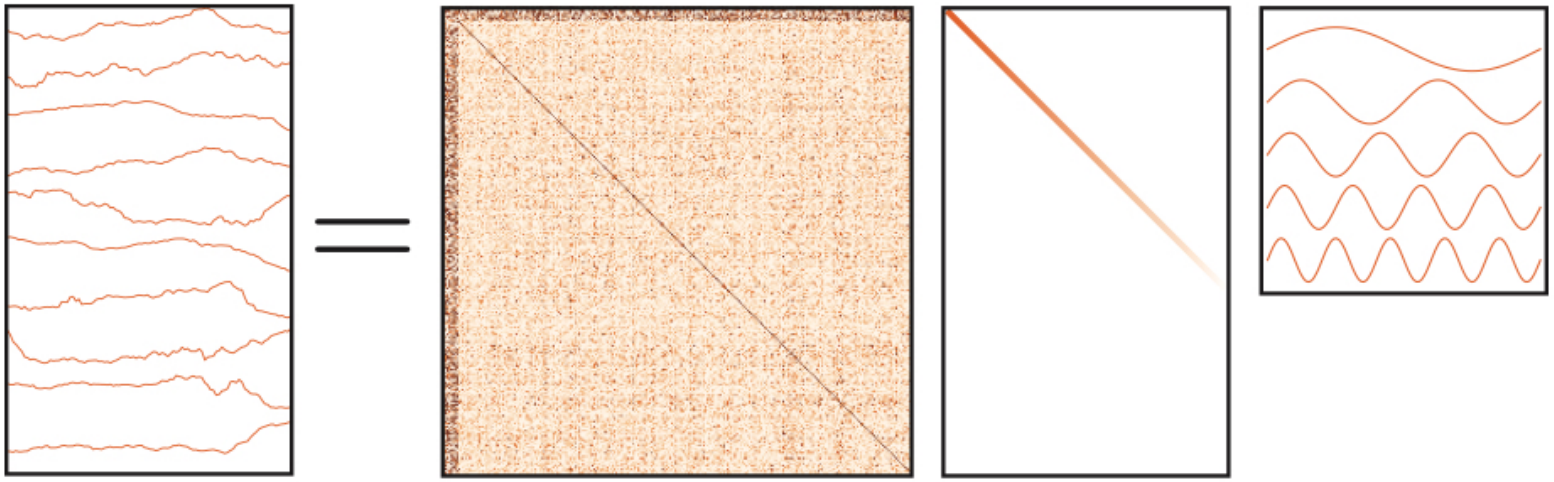
A



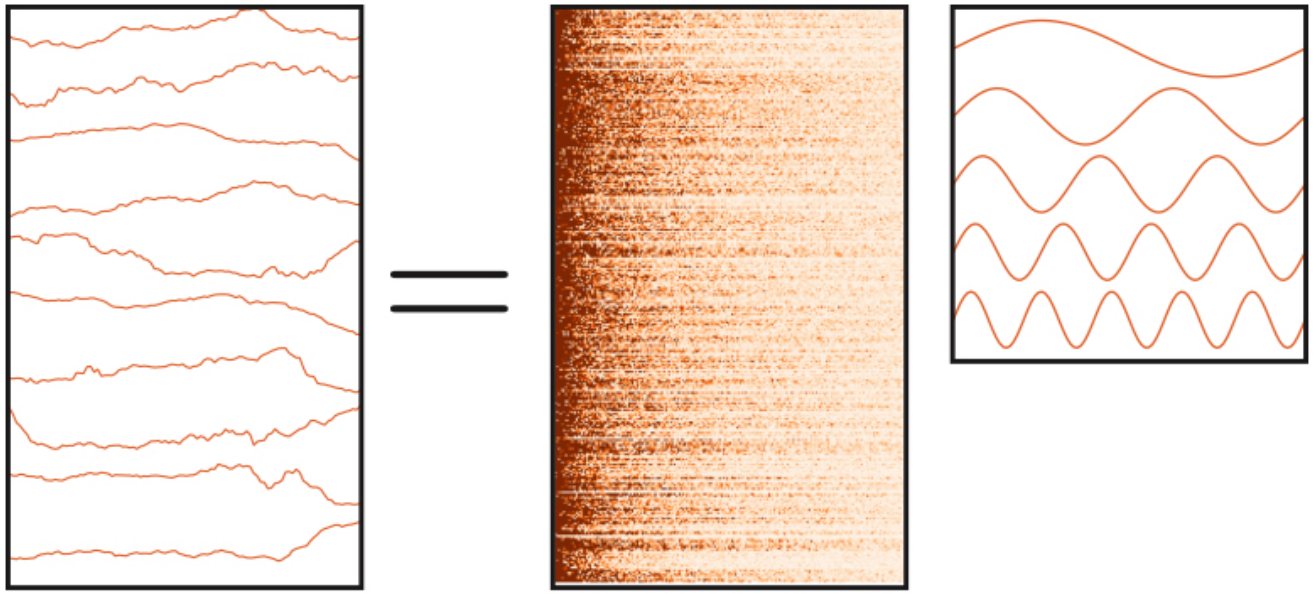
A



V^T

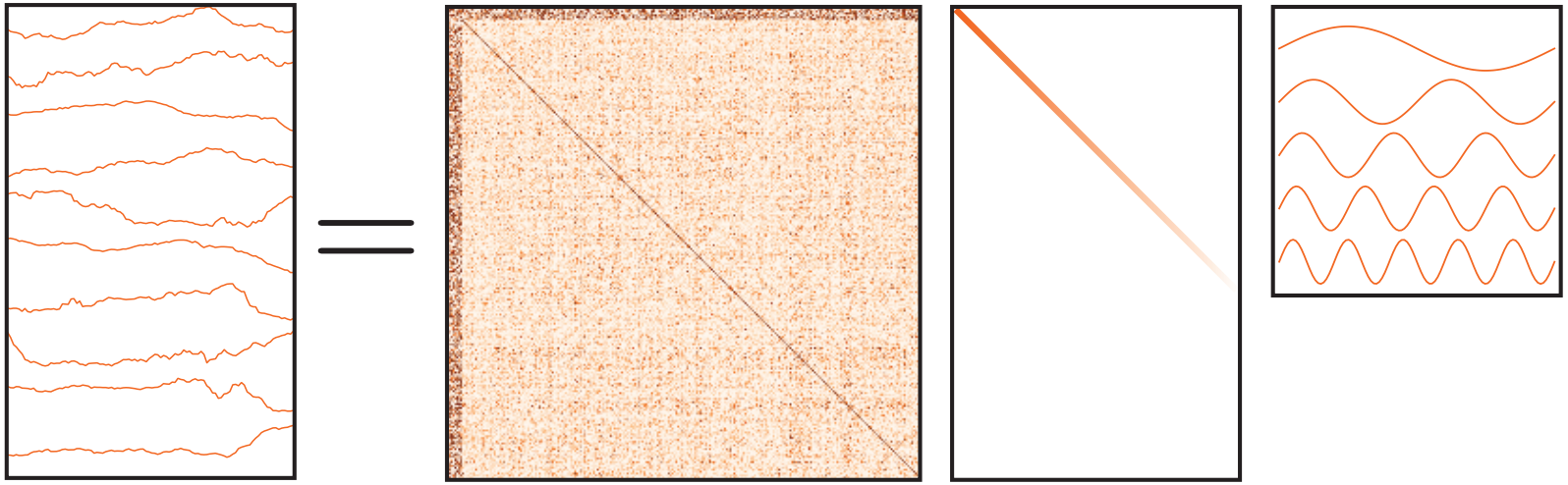


$$A = U \Sigma V^T$$



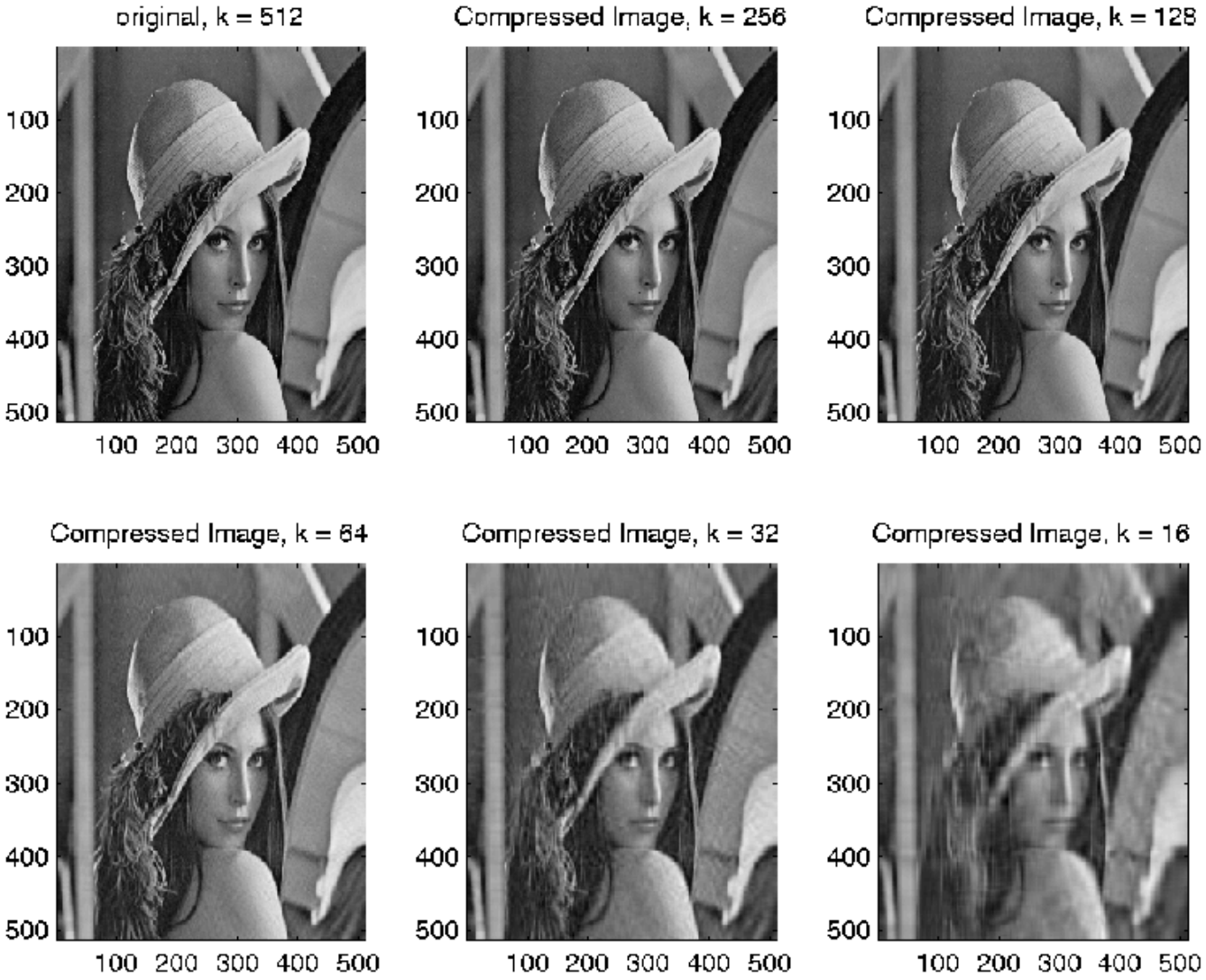
$$A = W \quad V^T$$

Singular Value Decomposition

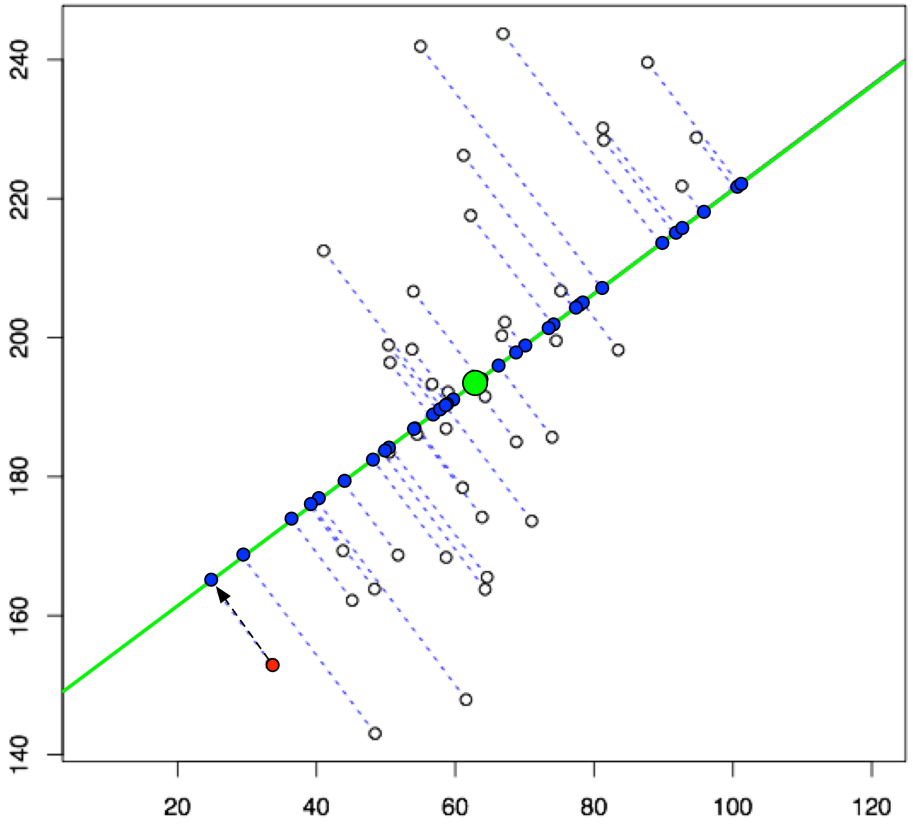


$$A = U \Sigma V^T$$

SVD Compression



PCA



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