

$$x = \begin{bmatrix} 2 \\ 7 \end{bmatrix}$$



$$\begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \longrightarrow \begin{pmatrix} y_1 \\ y_2 \end{pmatrix}$$

$$y_1 = a x_1 + b x_2$$

$$y_2 = c x_1 + d x_2$$

$$y = Ax$$

$$= \begin{pmatrix} a & b \\ c & d \end{pmatrix}$$

$$\begin{pmatrix} x_1 \\ x_2 \end{pmatrix}$$

$$= \begin{pmatrix} ax_1 + bx_2 \\ cx_1 + dx_2 \end{pmatrix}$$

$$= \begin{pmatrix} ax_1 + bx_2 \\ cx_1 + dx_2 \end{pmatrix}$$

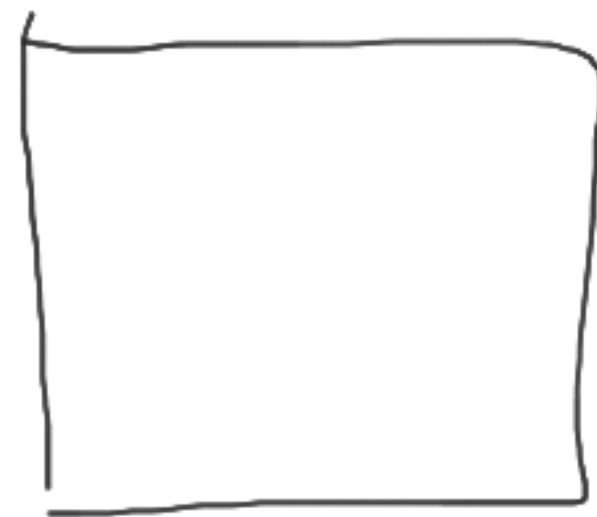
$$x \cdot y = \|x\| \cdot \|y\| \cos(\theta)$$

$$x \cdot y = x_2 \cdot y_2 + x_2 \cdot y_2$$

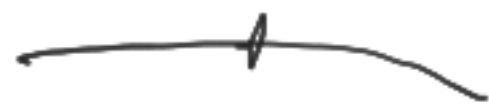
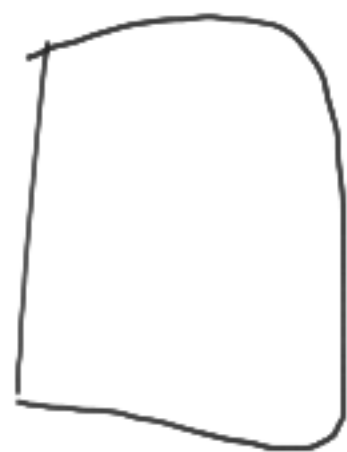


$$\cos = 0$$

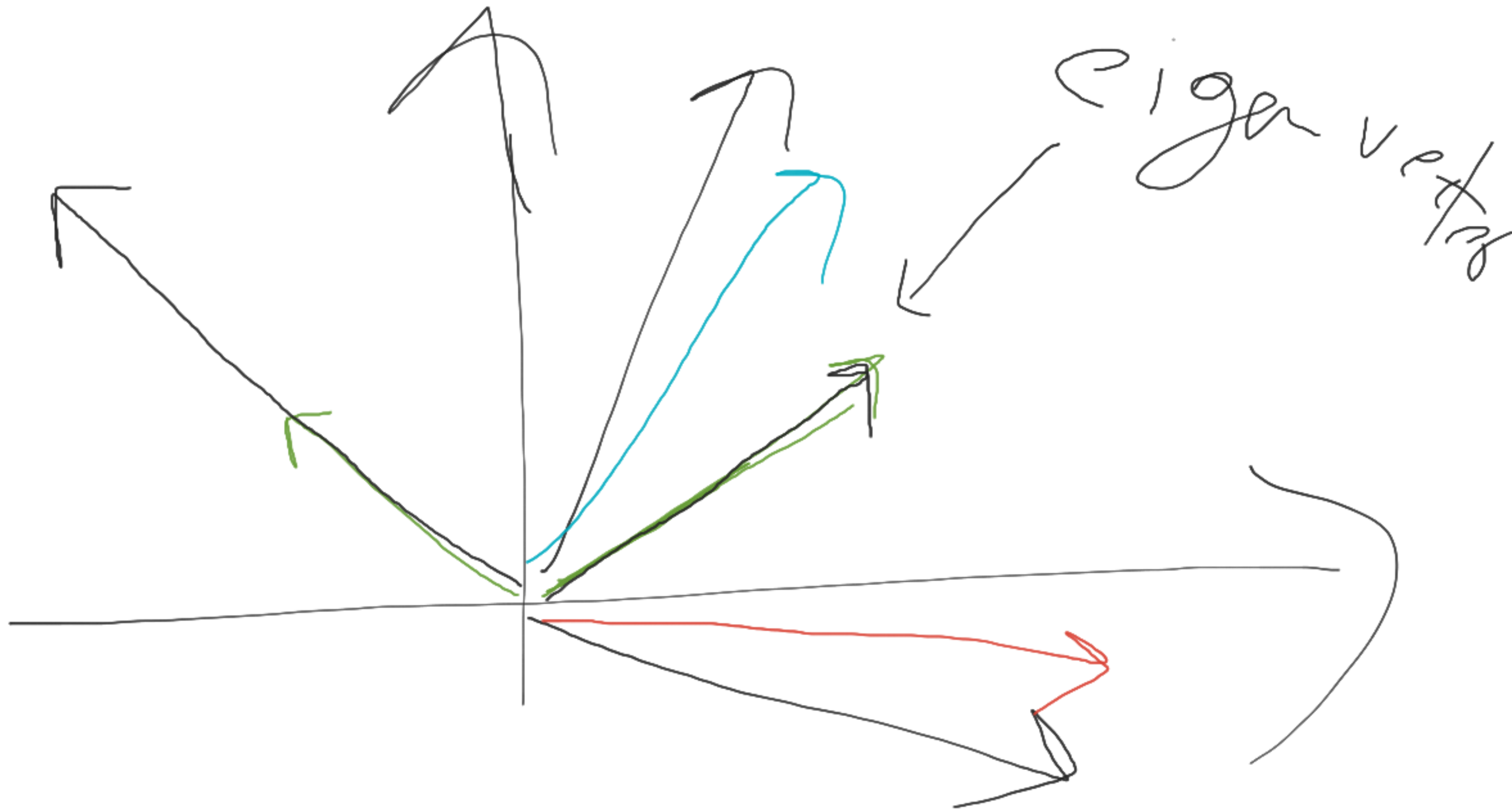
$A \in \mathbb{R}^{2 \times 2}$

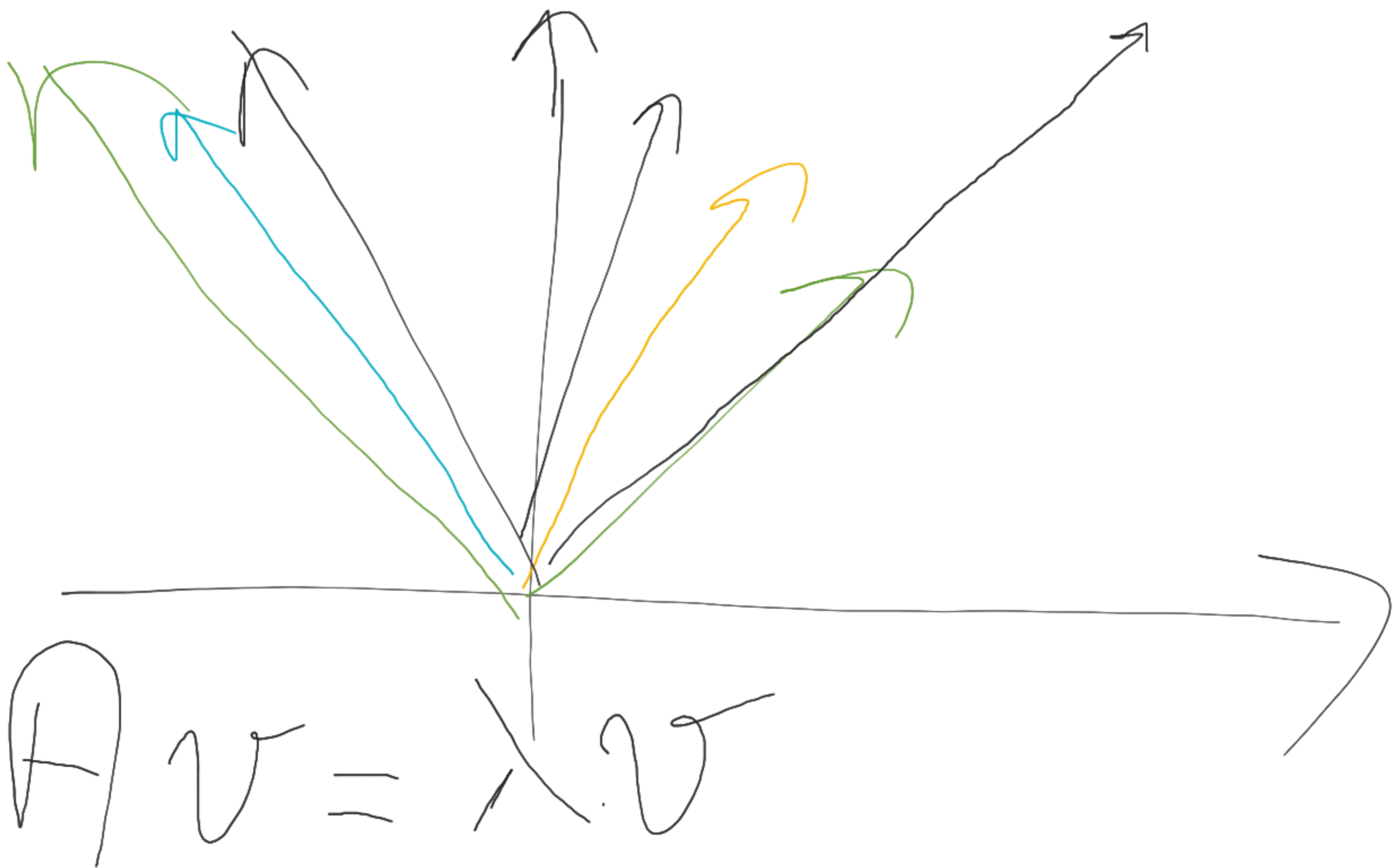


\mathbb{R}^2



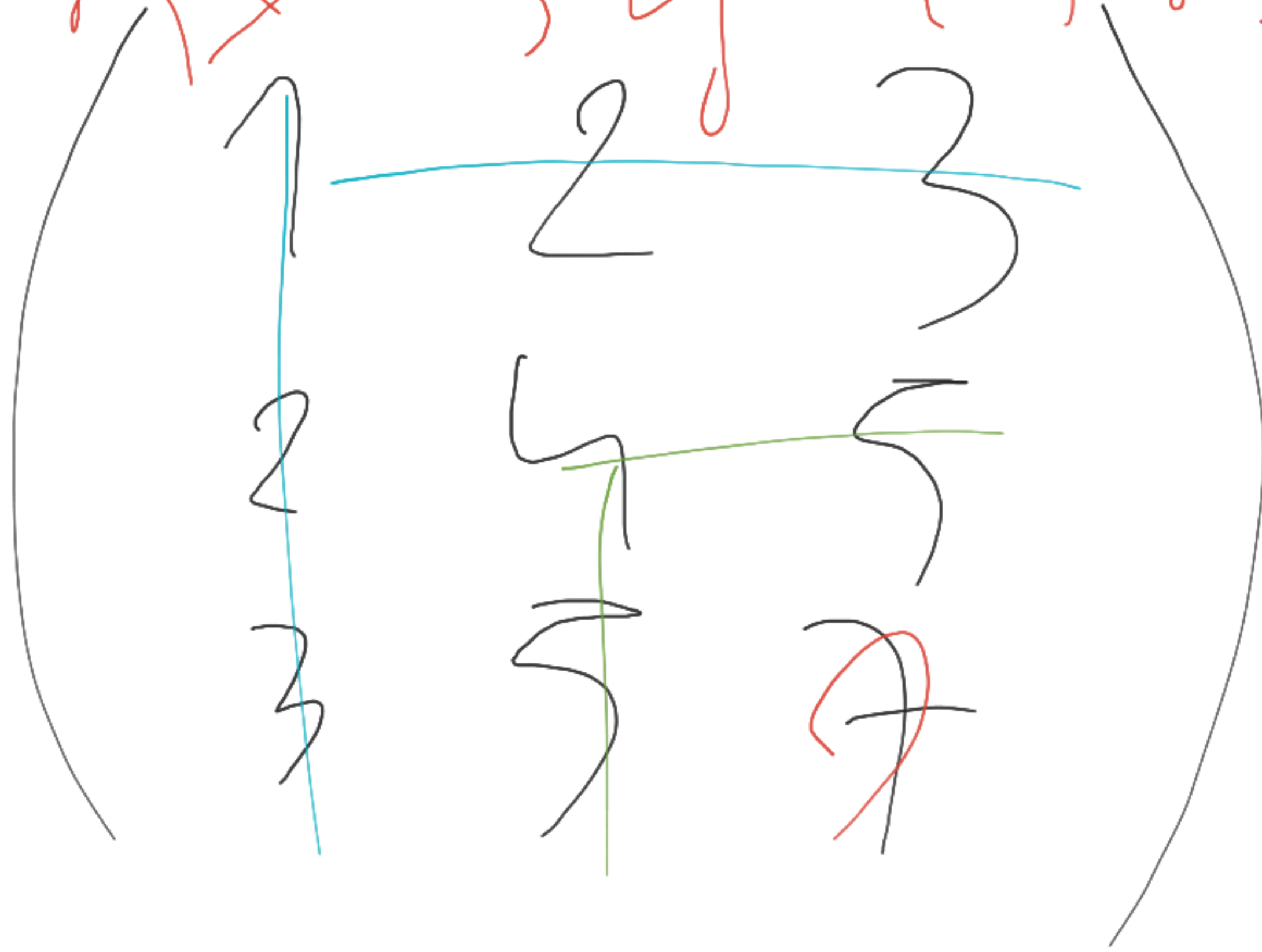
A





notation

sym + nc.



eight Verts
are

1

5	1	5	1	5	2
1	1	2	3		
2	1	2	3		
3	1	2	3		

Matrx of Correlation

Weight	height
,	,
,	,
,	,

$$Var(X) = \frac{1}{n} \sum (X_i - \bar{X})^2$$

$$Cov(X, Y) = \frac{1}{n} \sum (X_i - \bar{X})(Y_i - \bar{Y})$$

$$\rho(X, Y) = \frac{Cov(X, Y)}{\sigma_X \sigma_Y}$$

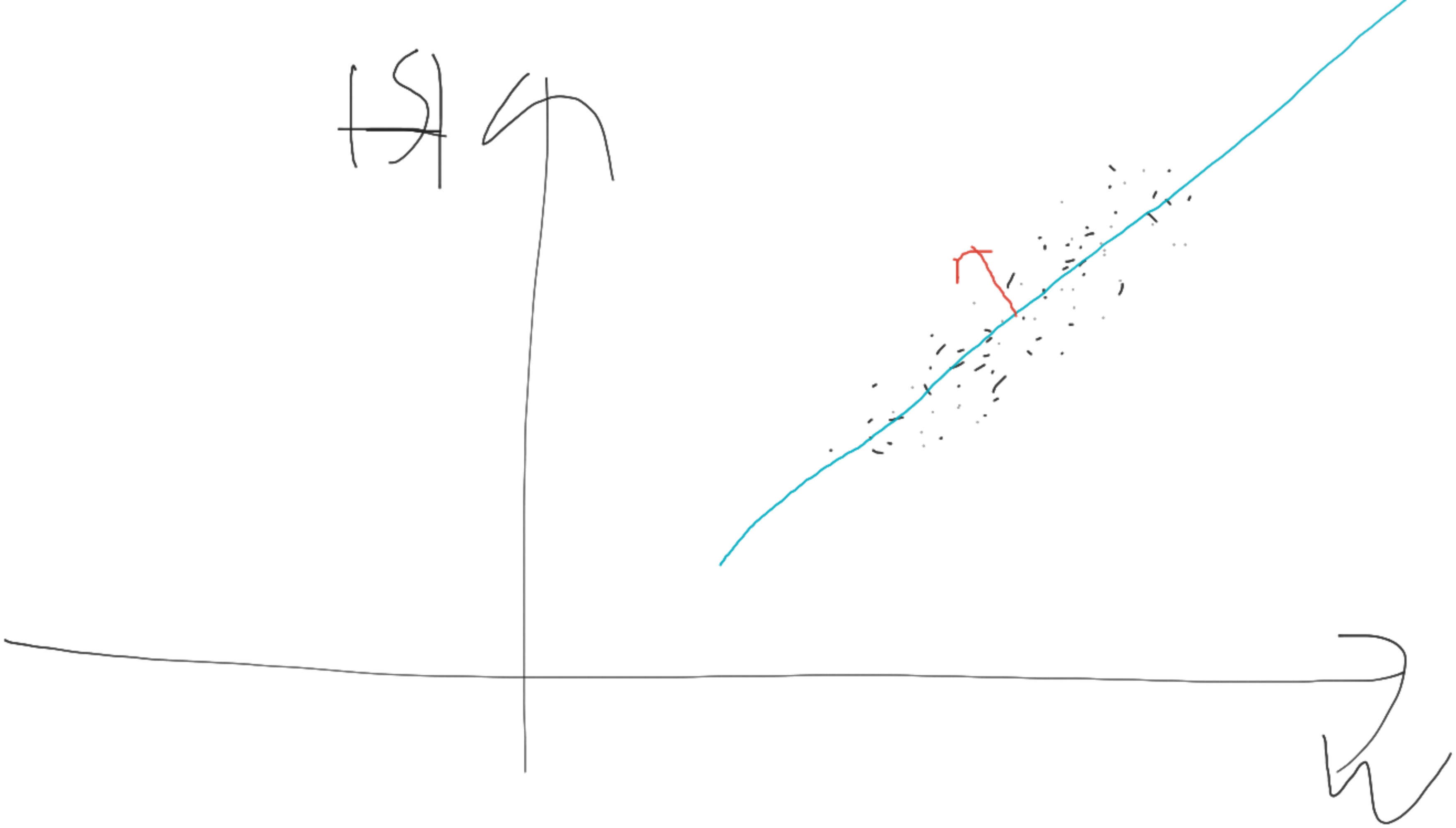
W	H	A	S
λ	λ		
.	/		
/	.	/	/
-	/	.	.

PCA




v_2	v_1	v_3	v_4
.	.		
/	/	/	.
/	/	.	/





① Center data $X_i - \bar{X}$

↓
② COVariance Mat

 $(\text{cov}(2,2) \text{ Var } 1 \quad | \quad \text{Cov}(2,2))$

③ eigen values
eigen vectors

④
||

