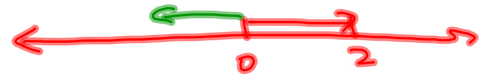
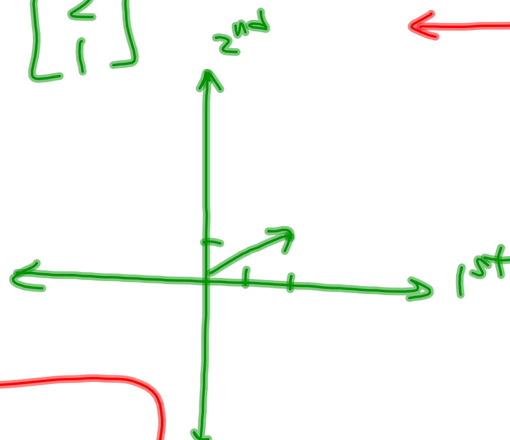
vector space

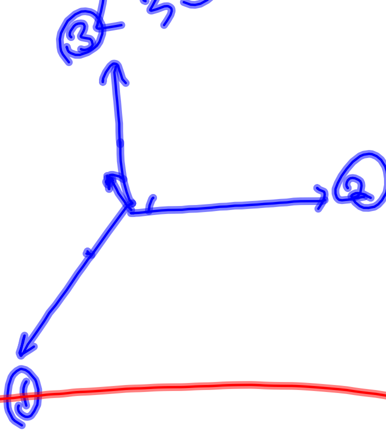
$R^1 \rightarrow$ a line, $[2]$ $[-2]$



$R^2 \rightarrow \begin{bmatrix} 2 \\ 1 \end{bmatrix}$



R^3 $\begin{bmatrix} 2 \\ 1 \\ 3 \end{bmatrix}$



R^4

⋮

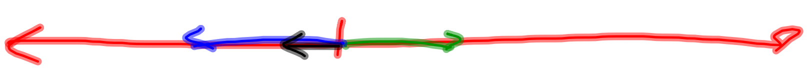
ex) R^2

$$\begin{bmatrix} a \\ b \end{bmatrix} + \begin{bmatrix} c \\ d \end{bmatrix} = \begin{bmatrix} \\ \end{bmatrix}$$

$$c\begin{bmatrix} a \\ b \end{bmatrix} = \begin{bmatrix} ca \\ cb \end{bmatrix}$$

R^1

$$[a] + [b] = [a+b]$$

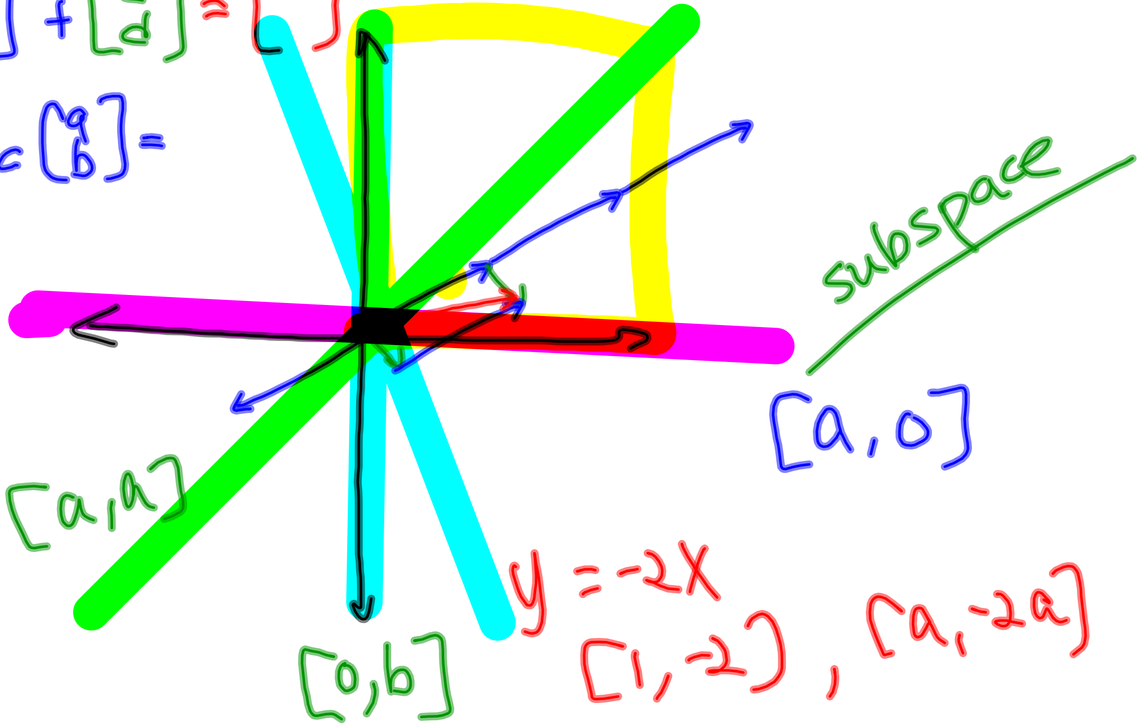


$$c\,[a] = \underline{\underline{[ca]}}$$

R^2

$\begin{bmatrix}a\\b\end{bmatrix}+\begin{bmatrix}c\\d\end{bmatrix}=\begin{bmatrix} \ \\ \ \end{bmatrix}$

$c\begin{bmatrix}a\\b\end{bmatrix}=$

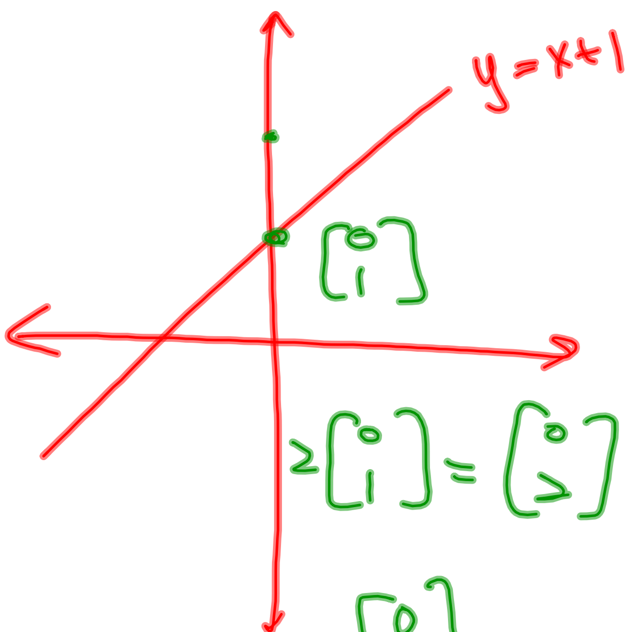


$y=-2x$

$[1,-2]$, $[a,-2a]$

$$\begin{bmatrix}a\\-2a\end{bmatrix}+\begin{bmatrix}b\\-2b\end{bmatrix}=\begin{bmatrix}a+b\\-2a-2b\end{bmatrix}$$

$$c\begin{bmatrix}a\\-2a\end{bmatrix}=\begin{bmatrix}ca\\-2ca\end{bmatrix}$$



$\begin{bmatrix} 0 \\ 1 \end{bmatrix}$

$2\begin{bmatrix} 0 \\ 1 \end{bmatrix} = \begin{bmatrix} 0 \\ 2 \end{bmatrix}$

$\begin{bmatrix} 0 \\ 0 \end{bmatrix}$

R^2

- lines that pass through (0, 0)
- $\begin{bmatrix} 0 \\ 0 \end{bmatrix}$
- R^2

Construct a subset of x-y plane that is

closed under vector addition/subtraction but not scalar multiplication.

$c\begin{bmatrix} a \\ 0 \end{bmatrix}$ $\qquad$ $\begin{bmatrix} a \\ 0 \end{bmatrix}$ $\quad a$