

2/1/2017 Class exercises.

③ a

⑦ a

④ b

⑧ a

⑤ c

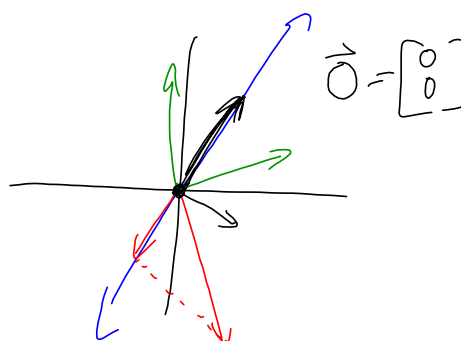
⑨ c

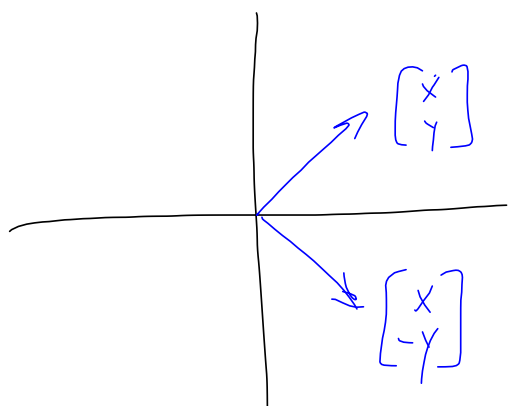
⑥ b

⑩ b

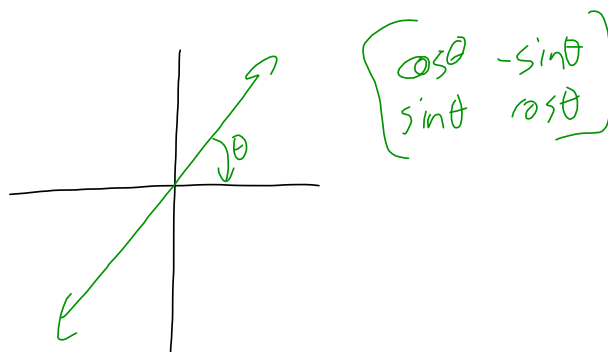
⑪ c

⑫ c, d?





$$\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} x \\ -y \end{bmatrix}$$



$$\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$$

$$\begin{bmatrix} a \\ b \\ ab \end{bmatrix}$$

closed under addition? No  
Scalar multiplication? No

$$\begin{bmatrix} 1 \\ 2 \\ 2 \end{bmatrix} + \begin{bmatrix} -5 \\ 3 \\ -15 \end{bmatrix} = \begin{bmatrix} -4 \\ 5 \\ -13 \end{bmatrix}$$

$$3 \begin{bmatrix} 1 \\ 2 \\ 2 \end{bmatrix} = \begin{bmatrix} 3 \\ 6 \\ 6 \end{bmatrix}$$

$$S = \left\{ \begin{bmatrix} x \\ y \end{bmatrix} \in \mathbb{R}^2 \mid y \geq 0 \right\}$$

closed under  
addition?

Yes

closed under  
scalar mult.?

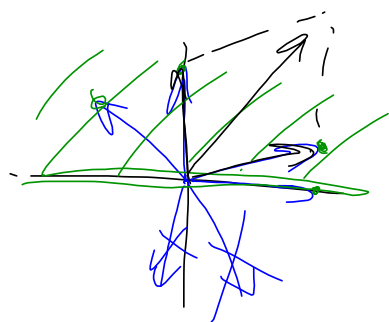
No

$$\begin{bmatrix} -5 \\ 3 \end{bmatrix} \quad \begin{bmatrix} 0 \\ 1 \end{bmatrix} \quad \begin{bmatrix} 0 \\ 0 \end{bmatrix}$$

$$\begin{bmatrix} 2 \\ 17 \end{bmatrix}$$

$$2 \begin{bmatrix} -5 \\ 3 \end{bmatrix} = \begin{bmatrix} -10 \\ 6 \end{bmatrix}$$

$$-2 \begin{bmatrix} -5 \\ 3 \end{bmatrix} = \begin{bmatrix} 10 \\ -6 \end{bmatrix}$$



$$S = \left\{ \begin{bmatrix} x \\ y \end{bmatrix} \in \mathbb{R}^2 \mid xy \leq 0 \right\}$$

$$\begin{bmatrix} -1 \\ 2 \end{bmatrix} + \begin{bmatrix} 3 \\ -5 \end{bmatrix} = \begin{bmatrix} 2 \\ -3 \end{bmatrix}$$

