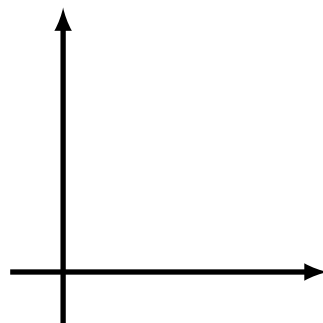
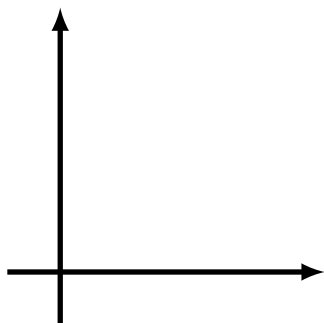


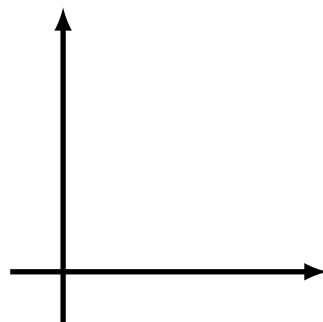
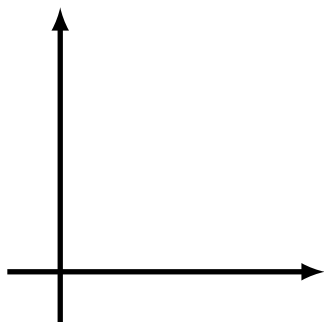
Example.

$$A = \begin{bmatrix} 2 & 1 \\ 1 & 3 \end{bmatrix}$$



Example.

$$A = \begin{bmatrix} 2 & 3 \\ 2 & 1 \end{bmatrix}$$



### Theorem

If  $A$  is a  $2 \times 2$  matrix then the linear transformation  $T_A: \mathbb{R}^2 \rightarrow \mathbb{R}^2$  preserves orientation if  $\det A > 0$  and reverses orientation if  $\det A < 0$ .