

# Orthogonality

If  $\vec{u} \cdot \vec{v} = 0$ , then  $\vec{u}, \vec{v}$  are Orthogonal

If 2 vectors are orthogonal, then  $||\vec{u} + \vec{v}||^2 = ||\vec{u}||^2 + ||\vec{v}||^2$

Find the vector orthogonal to  $\begin{bmatrix} 1 \\ 2 \end{bmatrix}$ .

$$\begin{bmatrix} 1 \\ 2 \end{bmatrix}^{\perp} = \begin{bmatrix} 2 \\ -1 \end{bmatrix}$$

Proof,

$$\vec{u} \cdot \vec{v} = \begin{bmatrix} 2 \\ -1 \end{bmatrix} \cdot \begin{bmatrix} 1 \\ 2 \end{bmatrix}^{\perp} = 0$$