

$$\vec{u} = \begin{bmatrix} 2 \\ 4 \end{bmatrix} \Rightarrow -2\vec{u} = \begin{bmatrix} -4 \\ -8 \end{bmatrix}$$

Adding and scaling vectors

- The sum of two vectors \vec{u} and \vec{v} in \mathbb{R}^n is the element-wise sum of their components:

$$\vec{u} + \vec{v} = \begin{bmatrix} u_1 + v_1 \\ u_2 + v_2 \\ \vdots \\ u_n + v_n \end{bmatrix} \quad \leftarrow \text{also a vector!}$$

- If c is a scalar, then:

$$c\vec{v} = \begin{bmatrix} cv_1 \\ cv_2 \\ \vdots \\ cv_n \end{bmatrix}$$

