

Vector Addition

The mathematical definition of a **vector addition** in \mathbb{R}^n is to add the elements entry by entry.

Lets look at the following example of two vectors:

$$\bullet \vec{x} = \begin{bmatrix} a_1 \\ a_2 \\ a_3 \\ \vdots \\ a_n \end{bmatrix} \in \mathbb{R}^n$$

$$\bullet \vec{y} = \begin{bmatrix} b_1 \\ b_2 \\ b_3 \\ \vdots \\ b_n \end{bmatrix} \in \mathbb{R}^n$$

The result, $\vec{x} + \vec{y}$ will be in \mathbb{R}^n as well.

Mathematically:

$$\vec{x} + \vec{y} = \begin{bmatrix} a_1 + b_1 \\ a_2 + b_2 \\ a_3 + b_3 \\ \vdots \\ a_n + b_n \end{bmatrix} \in \mathbb{R}^n$$

Equation 4