Definition

Let $\vec{u} = \langle u_1, u_2, u_3 \rangle$ and $\vec{v} = \langle v_1, v_2, v_3 \rangle$ be vectors, $\vec{u}, \vec{v} \in \mathbb{R}$. The dot product $\vec{u} \cdot \vec{v}$ is defined as

$$\vec{u} \cdot \vec{v} = u_1 v_1 + u_2 v_2 + u_3 v_3 \tag{3}$$