

## 1 | **Cauchy-Schwarz Inequality important**

'One of the most important inequalities in mathematics'

Suppose  $u, v \in V$  (where  $V$  is an inner product space). Then

$$|\langle u, v \rangle| \leq \|u\| \|v\|$$

The inequality is an equality iff one of  $u, v$  is a scalar multiple of the other.

### 1.1 | **proof is by the orthogonal decomposition**

### 1.2 | **results**

#### 1.2.1 | **triangle inequality**