

## 1 | **Axler6.23 orthonormal def**

- A list of vectors is called *orthonormal* if each vector in the list has norm 1 and is orthogonal to all other vectors in the list
- in other words, a list  $e_1, \dots, e_m$  of vectors in  $V$  is orthonormal if

$$\langle e_j, e_k \rangle = \begin{cases} 1 & \text{if } j = k \\ 0 & \text{if } j \neq k \end{cases}$$

## 2 | **results**

### 2.1 | **Axler6.25 norm of an orthonormal linear combination Pythagorean theorem**

If  $e_1, \dots, e_m$  is an orthonormal list of vectors in  $V$  then

$$\|a_1 e_1 + \dots + a_m e_m\|^2 = |a_1|^2 + \dots + |a_m|^2$$

Pythagorean theorem

### 2.2 | **Axler6.26 orthonormal bases are linearly independent**