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

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

Pythagorean theorem

2.2 | **Axler6.26 orthonormal lists are linearly independent**

Any orthogonal list is linearly independent, so an orthonormal list must also be linearly independent.