1 | **Problem**

Suppose V is a real inner product space and $v_1, \ldots, v_m$ is a linearly independent list of vectors in V. Prove that there exist exactly 2^m orthonormal lists $e_1, \ldots, e_m$ of vectors in V that preserve the prefix spans.

2 | **Proof Sketch**

In general, during the Gram-Schmidt procedure, both e_j or $-e_j$ at each step