

Extra Credit Assignment 4

Due Friday, February 12, 11:59 PM

1. Let A be an orthogonal n -by- n matrix. Show that the columns of A form an orthonormal basis for \mathbb{R}^n . Conversely, show that any (ordered) orthonormal basis of \mathbb{R}^n gives rise to an orthogonal matrix.
2. Is there a sense in which $O_n(\mathbb{R})$ looks like it is “built” out of S^{n-1} and copies of $O_{n-1}(\mathbb{R})$?
3. What “dimension” should $O_n(\mathbb{R})$ have? (For example, a circle is 1-dimensional, while a sphere is 2-dimensional.)