There is the one non-book left over from last week. I’ve repeated it below. Come ask for hints if need be!

1.

a. Show that every connected manifold is path connected. **Hint:** Show it is locally path connected.

b. Show that if \( p, q \) are elements of the interior of the closed unit ball

\[
\mathbb{B}^n = \{ x \in \mathbb{R}^n : |x| \leq 1 \},
\]

then there is a homeomorphism \( \phi : \mathbb{B}^n \to \mathbb{B}^n \) such that \( \phi(p) = q \) and such that \( \phi(x) = x \) for every \( x \) with \( |x| = 1 \).

c. Show that the homeomorphism group of a connected manifold acts transitively. In other words, show that if \( M \) is a connected manifold, then for any two points \( p \) and \( q \) in \( M \) there is a homeomorphism \( \psi : M \to M \) such that \( \psi(p) = q \).