Problem 1. Show that $\pi_1(S^n) = 1$ for $n \geq 2$.

Problem 2. Show that $e : \mathbb{R} \to S^1$ is a covering map where $e(t) = \exp(2\pi it)$.
Problem 3. Show that $\pi_1(\mathbb{P}^n) = \mathbb{Z}_2$ for $n \geq 2$.

Problem 4. Show that there is no retraction $r : D^2 \to \partial D^2$. 
Problem 5. State the following theorems.

The Seifert-van Kampen Theorem

The Fundamental Theorem of Algebra

The Brouwer Fixed Point Theorem

The Jordan Curve Theorem