

MTG 5317/4303 ASSIGNMENT

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These problems are due on April 13, 2015. Please use the class periods on April 8 and 10 to work on these problems together. Write up the solutions clearly and succinctly. You may consult our textbook and other books and discuss the problems with each other. Each person should turn in the assignment separately.

Problem 1. Give a complete proof that $\pi_1(S^1) \cong \mathbb{Z}$.

Problem 2. Use the fundamental group to show that if $f : D^2 \rightarrow D^2$ is continuous, then there exists an $x \in D^2$ such that $f(x) = x$. This is the **Brouwer Fixed Point Theorem** for D^2 .