7 | Higher Homotopy Groups

1) S^1 is not a retract of the disc D^2

2) For each map $f\colon D^2 \to D^2$ there exists a point $x_0 \in D^2$ such that $f(x_0) = x_0$

3) For each map $f\colon S^2 \to \mathbb{R}^2$ there exists $x \in S^2$ such that $f(x) = f(-x)$

4) If $A_1, A_2 \subseteq S^2$ are closed sets such that $A_1 \cup A_2 = S^2$ then one of these sets contains a pair of antipodal points $\{x, -x\}$

Higher homotopy groups via maps $S^n \to X$.

7.1 Note. Relation to $\pi_0(X)$.

Higher homotopy groups via maps $I^n \to X$.

7.2 Theorem. *For $n \geq 2$ then the group $\pi_n(X, x_0)$ is abelian for any pointed space (X, x_0).*