Math 8307, Algebraic Topology II
Homework 5
Due in-class on **Wednesday, March 4**

1. Suppose X is a CW-complex whose top cells are in dimension d. Show that any map from X to a connective cover $C_m X$ must be nullhomotopic if $m > d$.

2. Similarly, show that there cannot be any map $P_2 S^2 \to S^2$ from the Postnikov stage to S^2 that induces an isomorphism on π_2.

3. Show that $S^3 \times P_2 S^2$ has the same homotopy groups as S^2, but that the two cannot be homotopy equivalent.

4. Suppose $A \to X$ is a CW-inclusion such that A is n-connected and the inclusion is m-connected. Find the strongest relationship that you can between $\pi_k(X/A)$ and $\pi_k(X, A)$ using the Blakers-Massey excision theorem,