

Math 8200, Spring 2011: Problem Set 3. Due Tuesday, February 8

I. Hatcher: Section 1.1, problems 1,2,3, and 7.

II. Let $f: X \rightarrow Y$ be a continuous map and let $h: [0,1] \rightarrow X$ be a path from x_0 to x_1 , so that we have a change-of-basepoint isomorphism $\beta_h: \pi_1(X, x_0) \rightarrow \pi_1(X, x_1)$. Prove that the diagram

$$\begin{array}{ccc} \pi_1(X, x_0) & \xrightarrow{f_*} & \pi_1(Y, f(x_0)) \\ \downarrow \beta_h & & \downarrow \beta_{f \circ h} \\ \pi_1(X, x_1) & \xrightarrow{f_*} & \pi_1(Y, f(x_1)) \end{array}$$

is commutative.