Problem Set #3
Due: Wednesday, Feb. 1

(1) Show that any convex subset of R^n is simply connected.

(2) Let X be a topological space.
  (a) Let f, $g : I \mapsto X$ be two paths from p to q. Show that $f \sim g$ if and only if $f \cdot g^{-1} \sim c_p$.
  (b) Show that X is simply connected if and only if any two paths in X with the same initial and terminal points are path homotopic.

(3) Let X be an path-connected topological space. Under what condition is the following statement true: For any two points p, $q \in X$, all path classes from p to q give rise to the same isomorphism of $\pi_1(X, p)$ onto $\pi_1(X, q)$