

Math 527 - Homotopy Theory
Spring 2013
Homework 8, Lecture 3/8

Problem 4. Let $f: X' \xrightarrow{\sim} X$ and $g: Y' \xrightarrow{\sim} Y$ be pointed maps between well-pointed spaces, and assume that f and g are weak homotopy equivalences.

- a. Show that the map $f \vee g: X' \vee Y' \rightarrow X \vee Y$ is a weak homotopy equivalence.
- b. Show that the map $f \wedge g: X' \wedge Y' \rightarrow X \wedge Y$ is a weak homotopy equivalence.

Remark. One cannot remove the assumption of well-pointedness in general. There are even examples where f and g are homotopy equivalences, yet $f \vee g$ is not a weak homotopy equivalence.