

## Topology Projects

Choose one of the following. These are due by Friday, April 27.

1. Show that the comb and flea space of Exercise 3.13 is not *path connected*. A *path* in a space  $X$  from  $x$  to  $y$  is a continuous function  $f : [0, 1] \rightarrow X$  with  $f(0) = x$  and  $f(1) = y$ , and a space  $X$  is *path connected* if given any two points  $x, y \in X$  there is a path in  $X$  from  $x$  to  $y$ .
2. Construct a continuous one-to-one function from the Klein bottle into  $\mathbb{R}^4$ .
3. Construct a continuous one-to-one function from the projective plane into  $\mathbb{R}^4$ .
4. Exercises 5.19-5.21