

## Exercise sheet 5

1. Prove that if  $f_i : X \rightarrow Y$ ,  $i = 1, 2$  are covering maps, then so is  $f_1 \times f_2 : X_1 \times X_2 \rightarrow Y_1 \times Y_2$ .
2. Prove that if  $f : X \rightarrow Y$  is a covering map, and  $A$  is a subspace of  $Y$ , then  $f : f^{-1}(A) \rightarrow A$  is a covering map.
3. If  $f : X \rightarrow Y$  is a covering, then the set  $f^{-1}(y)$  is called the fibre at  $y$ . Prove that if  $Y$  is connected, and the fibre at one point is finite, then all fibres have the same number of elements.

**to be updated**