

Topology

HW 10

Due Thursday, Nov 30 (5:00PM)

1. 3.23

2. 3.26

3. Let $f : X \rightarrow Y$, with $f(X) = Y$. There are three topologies in this problem. One is T_X , which is a given topology for X , one is T_Y , which is a given topology for Y , and the third is T_f , which is the quotient topology on Y induced by f . Assume in this problem that f is continuous when using T_X and T_Y .

a) Explain why $T_Y \subset T_f$ and give an example to show that it is possible for $T_Y \neq T_f$.

b) If, in addition, f is an open map prove that f is a quotient map and $T_Y = T_f$.

4. Prove that the composition of two quotient maps is a quotient map.

5. 14.1

6. 14.2

7. 14.4