

NOTES

DEVANSH TRIPATHI

ABSTRACT. This is the collection of various techniques that I encounter while doing math.

For construction of injection. If there exists a surjection from set $A \rightarrow B$ then to construct injection from $B \rightarrow A$, for each $b \in B$ there will exist at least a $a \in A$ such that $f(a) = b$ (because of surjection). Then take $\min\{a \in A : f(a) = b\}$ and map b to that minimum element of A . This will result in an injection.

To find counter example when Hausdorff condition is dropped. Hausdorff condition avoids trivial topology since trivial topology can never be Hausdorff. Hence after dropping Hausdorff check some example with trivial topology where theorem may be false that's why Hausdorff was used to avoid that case.