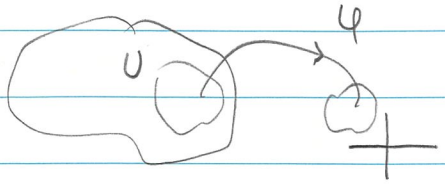
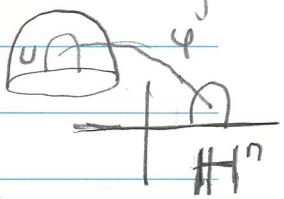
Reminder II

- 2-dim compact, connected, orientable topological manifold = sphere + handles attached.

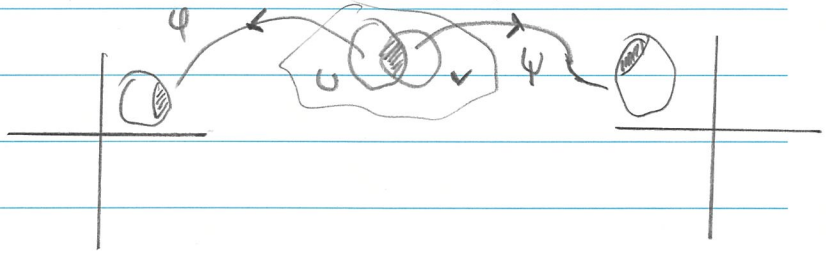


(U, φ) = chart, coordinate neighbourhood, or coordinate system



- topological manifold with boundary
- Smooth manifold = topological manifold + maximal atlas

"smooth transitions"



- $F : M \to N$ smooth map, diffeomorphism

local jacobian matrix, its rank at $p \in M$.

- Immersion ($\mathrm{rank}(F) = m$), submersion ($\mathrm{rank}(F) = n$)

↑ not always injective. If injective, $F(M) \subset N$ can be endowed with the topology of M.

↑ not so interesting, N does not play any role