Algebraic Topology:

Use algebra to study topology!

(spaces,maps)$\rightarrow$ (algebraic objects, homomorphisms) [**functor**]

Topological problem (existence of space/map with certain properties) $\Rightarrow$ algebraic problem (existence of group/ring/homomorphism with certain properties)

No solution to algebraic problem $\Rightarrow$ no solution to topological one.

Solution to algebraic problem $\Rightarrow$ <u>evidence</u> of solution to topological one.