Deductive Inference

- conclusive
- proves theorems
- examples
  - **Example 2 (Right triangles)**

    Two statements:

    1. One of the angles of each right triangle is $90°$.
    2. Triangle A is a right triangle.

    Conclusion: One of the angles of triangle A is $90°$.
  - **Example 3 (Rise of Skywalker)**

    Suppose we want to know what percent of Austrian population watched the new Star Wars movie. The only way to answer this exactly is to ask all Austrians if they watched the movie, which is not feasible. Thus, we ask a few Austrians about the movie, and on the basis of their responses we make probabilistic statements or predictions for the whole population.

Inductive Inference

- drawing conclusions from data of few experiments creates uncertainty
  - unless drawing conclusions from whole population
- [[Statistik]] provides priniciples to measure uncertainty with [[Wahrscheinlichkeit]]
- Inductive Inference omnipresent
- based on subset of totality of elements
  - draw conclusions for target population
- results in probabilities
- finds new knowledge in research

Methodology

- Goal: find out something about a certain target population
- Impractical to examine the entire population
- Examine a **sample** (a part) of it
- Make probabilistic inferences regarding the entire target population
- Goal: study a population with density $f(\cdot;\theta)$
- We know the form of the density but it contains an unknown parameter θ
- Take a random sample $X_1, X_2, \ldots, X_n$ of size n from $f(\cdot;\theta)$
- We compute the value of some function $t(x_1, x_2, \ldots, x_n)$ to estimate θ