

Discrete Structures

Mathematical Reasoning

Chapter 3, Sections 3.1 - 3.3

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Mathematical Reasoning

- ◇ **Theorem:** Statement that can be shown to be true.
- ◇ **Proof:** Sequence of statements that form an argument (used to show that a theorem is true).
- ◇ **Axioms, postulates:** Underlying assumptions about mathematical structures, hypotheses of a theorem, previously proved theorems.
- ◇ **Rules of inference:** Means used draw conclusions from other assertions, tie together the steps of a proof.
- ◇ **Lemma:** “Simple” theorem, used in the proof of a theorem.
- ◇ **Corollary:** Proposition that follows directly from a theorem.
- ◇ **Conjecture:** Statement whose truth value is unknown.

Mathematical Reasoning

- ◇ It is not sunny this afternoon and it is colder than yesterday
- ◇ We will go swimming only if it is sunny.
- ◇ If we do not go swimming, then we will take a canoe trip.
- ◇ If we take a canoe trip, then we will be home by sunset.
- ◇ Consequently, we will be home by sunset.