MATH 425A
ON THE HIERARCHY OF MATHEMATICAL SEMANTICS

FALL 2019

In this class, we will encounter some common mathematical jargon. The goal of this handout is to explain, or (at least) place some of this jargon into an appropriate context.

- A **theorem** is a statement of mathematical fact.

Typically, a statement is labeled a 'theorem' because the author deems is of some importance. Although there is frequent agreement on what constitutes 'a theorem', this labeling is inherently subjective.

- A **proposition** is a statement of mathematical fact.

It is generally agreed upon that not every statement of mathematical fact is worth labeling 'a theorem'. A proposition is a fact which is of lessor importance than a theorem. Again, this labeling is subjective.

- A **claim** is a statement of mathematical fact.

Typically, a claim is a statement made in a proof which is deemed obvious by the author; it is frequently not proven. In class, I will sometimes discuss (or outline) the argument required to prove a claim.

- A **lemma** is a statement of mathematical fact.

Typically a 'lemma' is a statement of fact that the authors deems useful in the proof of a theorem. One could, of course, prove the lemma in the course of proving the theorem, but this may make the proof of the theorem look unnecessarily difficult.

- A **corollary** is a statement of mathematical fact.

Typically a 'corollary' is a statement of fact that is an 'immediate' consequence of a theorem. It is common to state corollaries in an effort to help illustrate the utility of a theorem.