

1. I'll hold *office hours* as scheduled, through 21 May.
2. I presented some material from the unit, *Gödel's and Tarski's Theorems on Incompleteness and Undefinability*.
 - a. Its paragraphs 8–10 constitute the logical core of Gödel's first incompleteness theorem. Gödel's work [1931] 1967 is considerably more involved, because he presented the theorem in the context of first-order natural-number arithmetic, a theory considerably weaker than the ZF set theory we are using. In our context, the theorem displays a true sentence s in the formalized ZF such that neither s nor its negation is provable.
 - b. Those paragraphs implicitly rely on our belief that our theorems in informal ZF set theory are true.
 - c. Paragraph 12 constitutes the core of Tarski's undefinability theorem. It shows that there is no formula of formalized ZF that can distinguish true formalized sentences from false ones. Tarski's work [1936] 1983 was simultaneous with Gödel's, and used the same methods.
 - d. Paragraph 13 shows that the dependence on our belief in ZF can be made more explicit by deriving the results from the hypothesis that formalized ZF be consistent: that no formalized ZF sentence and its negation be both provable.
 - e. Paragraph 14 deduces a version of Gödel's second incompleteness theorem: while the consistency of formalized ZF can be expressed as a formalized ZF sentence, that sentence is not provable, unless ZF is inconsistent (in which case *every* sentence would be provable).
3. Ms. Yaggie reported about her term project: *denotational semantics*.
 - a. This application of logic and lattice theory provides a framework for deep discussion of the semantics computer languages (and natural languages, for that matter).
 - b. She showed that ultrafilters can be used to delineate the concept denoted by a syntactic construct without requiring reference to real objects.
 - c. This theory was pioneered by Dana Scott in the 1960s.