Lecture 7: Quiz

Name:

Problem 1

Which set operation is the addition in a Boolean ring?
a) union
b) complement
c) intersection
d) symmetric difference

Problem 2

In the Boolean ring, which set is the 1 element satisfying $1 * A = A$ for all sets A?
a) the full set X
b) the empty set $\emptyset$
c) the set $\{1\}$
d) there is no 1 element

Problem 3

Which properties hold in a Boolean ring with addition + and multiplication $\cdot$?]
a) $A + A = A$ b) $A \cdot A = A$
c) $A \cdot A = \emptyset$
d) $A \cdot A = X$ e) $A + A = A \cdot A$
f) $A + A = \emptyset$

Problem 4

Which of the following sets have the same cardinality as the integers?
a) The two dimensional plane
b) The even numbers
c) The interval $[0, 1]$.

Problem 5

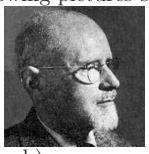
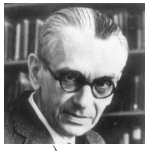
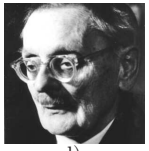
Which mathematician established first that there are different types of infinities?
a) Douglas Hofstadter
b) Georg Cantor
c) Alfred Tarski
d) Kurt Goedel

Problem 6

The Continuum Hypothesis is:
a) There is a cardinality between the cardinalities of the reals and integers.
b) There exists a cardinality different from the cardinality of the integers.
c) There exists an infinite set.
d) There exists a continuum of cardinalities.

Problem 7

One of the following pictures shows Kurt Goedel? Which one?


a)

b)

c)

d)

Problem 8

What does the heap paradox tell?
a) There no surprise heaps.
b) A heap from which a grain has been taken remains a heap.
c) A heap contains all grains which do not contain themselves.
d) A heap can not lie.
e) Heaps are creaps.
f) There is no heap.

Problem 9

Which two paradoxa have been found by Russell:
a) The Berry paradox about the smallest integer which can be described in 11 words.
b) The liars paradox: I'm a liar.
c) The set of all sets which do not contain themselves as a set.
d) There is no way to make a surprise examination this year.
e) The barber's paradox: the barber shaves everybody who does not shave himself.
f) In a waiting line in the supermarket one is always in the slowest line.

Problem 10

What does Goedel's incompleteness theorem tell? Pick two:
a) The Zermelo-Frenkel axiom system is incomplete.
b) Life is like a box of chocolates. One never knows what one is going to get.
c) We never know what is true since we can always change the axiom system.
d) In a strong enough system, there are true statements which can not be proven within the system.
e) The consistency of a strong enough axiom system can not be proven within a system.
f) The set which consists of all sets which do