MATH 300. INTRODUCTION TO MATHEMATICAL REASONING.
FALL 2015.
WEEK 2 (LECTURE 2,3)
PROPOSITIONAL ALGEBRA (CONTINUATION)

1. Reading: Section 1.1, Lectures 2,3 notes.

2. Home assignment (Due Mond, September 14; submit).

Sect.1.1: 9(a-d),10, 11(a-e,h,i)

Extra problems:

1) Find a propositional formula equivalent to the alternative (or exclusive) disjunction $f(P,Q)$ which is Truth iff exactly one of P,Q is Truth.

2)Find a propositional formula equivalent to the majority connective $g(P_1,P_2,P_3,P_4)$ which is Truth iff most of the propositions P_1,P_2,P_3,P_4 are Truth.

3)For the connective

$$(\sim P \vee Q)\wedge \sim (\sim R\vee \sim S)$$

find an equivalent formulas containing

only disjunctions and negations;

only conjuctions and negations.

4*) Is the system {conjunction, disjunction} (without the negation!) complete?

5*) Prove that if a natural number is not multiple 3, then its square has in division on 3 the remainder 1.

6)In a family there are 5 brothers: Nick, Alex, Roger, Andre, Dan. The mother found flowers at her bedroom and asked sons, who left them.

Nick: Alex or Roger left them.

Alex: Neither me nor Dan did it.

Roger: Are you both joke?

Andre: No. One of them said Truth but another one lied.

Dan. No, Andre, you not right.

The mother knows that 3 her sons never lie. Who did left flowers?