Math 215 – Fall 2017

Practice Homework # 3 – Assigned September 14th, due September 18th

Note: Remember that you must show your work to get full credit for a problem.

1. A grocery store in a small town has 600 lottery tickets for sale. Since the town only has a population of 1200 people, the store has stated that no person may get more then 1 ticket.

    (a) How may ways are there to distribute all the tickets among the town residents? Explain your reasoning.

    (b) Suppose the store changes its policy so that no person may get more then 2 tickets. How many ways are there to distribute all the tickets.

2. For each of the following logical statements state if it is a tautology, contradiction, or neither.

    (a)
    $$(A \to B) \leftrightarrow (\neg B \to \neg A).$$

    (b)
    $$(A \to B) \to (B \to A).$$

    (c)
    $$(C \to (A \lor B)) \to (A \to B).$$

    (d)
    $$(((A \lor B) \to C) \land A) \to C.$$

    (e)
    $$(Q \to (P \land \neg Q)) \land Q.$$

3. Create a true table for every part of the following logical statements.

    (a)
    $$(A \lor B) \to (B \to A).$$

    (b)
    $$A \to (B \to (A \land B)).$$

4. Reduce the following logical statements to disjunctive normal form using De Morgan's and the distributive laws.

    (a)
    $$(A \lor B) \land (C \lor D)$$

    (b)
    $$(A \to B) \land C$$