CS 2022/ MA 2201 Discrete Mathematics
A term 2020

Homework 1, due Monday 11 am, September 7

Most homeworks will be worth 100 points; consider the point value in determining how much time you spend on each question. The exercise and page numbers are from the 8th edition of Rosen: *Discrete Mathematics and Its Applications*. Homeworks must be readable and submitted online in a pdf file before the due date.

READING: Chapter 1.

1. Exercise 16 on page 14. (20 points)
2. Construct truth tables for each of the following compound propositions.
   (a) $(p \wedge q) \vee (p \wedge r)$
   (b) $(q \wedge p) \leftrightarrow (q \oplus p)$

   (20 points)
3. Are the following compound propositions tautologies?
   (a) $((p \rightarrow q) \wedge (q \rightarrow r)) \rightarrow (p \rightarrow r)$
   (b) $((p \wedge q) \wedge (q \wedge r)) \rightarrow (p \wedge r)$
   (c) $((p \oplus q) \wedge (q \oplus r)) \rightarrow (p \oplus r)$

   In other words are the logical operators implication, conjunction and exclusive-or transitive? (20 points)
4. Exercise 28 on page 38. (20 points)
5. Exercise 16 on page 70. (20 points)