CS 2233 Discrete Mathematical Structures – Fall 08

9/5/08

1. Homework

Due **9/15/08** before class

Most exercises on this homework are exercises from the textbook. Please refer to the corresponding exercise sections in the textbook (Rosen, 6th edition).

1.1 (a) (1 point) 10 a,c

   (b) (4 points) Read the definition of *converse*, *inverse*, and *contrapositive* on page 8 of the book.

      i. (2 points) Let p be "it rains" and let q be "the streets are wet". Express $p \to q$ as well as the converse, the inverse, and the contrapositive in English.

      ii. (2 points) Give truth tables for the converse, the inverse, and the contrapositive of $p \to q$. Which of the three is equivalent to $p \to q$ (justify your answer shortly)?

1.2 (a) (1 point) 6

   (b) (2 points) 24. Show the equivalence by establishing a sequence of equivalences. You may only use equivalences in Table 6 and the first equivalence in Table 7. **Annotate EVERY step with the equivalence name (and table number) that you used. This annotation is worth 1 point.**

   (c) (1 point) 60 a. Justify your answer shortly.

1.3 (a) (1 point) 2 a,b

   (b) (2 points) 8 a,b,c,d. Make your sentences concise and natural.

   (c) (1.5 points) 10 a,b,c

   (d) (1.5 points) 12 a,c,e

   (e) (1 point) 18 a,d

   (f) (2 points) 28 a,b

   (g) (1 point) 32 a

1.4 (a) (2 points) 8 a,b

   (b) (1 point) 20 a

   (c) (2 point) 30 b,d