

Discrete Mathematics

Homework 1

Due 2:20 pm, March 15, 2011

The following are exercises which you can practice at the Lab sessions or at home. The textbook gives out answers or hints. DO NOT hand in your solutions.

- Exercises 1.1.7, 1.1.11, 1.1.16, and 1.1.22 .
- Exercises 1.2.3 and 1.1.18 .
- Exercises 1.3.1, 1.3.10, 1.3.15, and 1.3.20 .
- Exercises 1.4.23 and 1.4.25 .
- Exercises 1.5.1 .

The following are homeworks. You MUST hand in your solutions by the due date.

1. Exercise 1.1.3
2. Exercise 1.1.12
3. Exercise 1.1.14
4. Exercise 1.1.20
5. Exercise 1.1.21
6. Exercise 1.2.2
7. Exercise 1.2.19
8. Exercise 1.2.20
9. Exercise 1.2.23
10. Exercise 1.3.6
11. Exercise 1.3.8
12. Exercise 1.3.14
13. Exercise 1.3.21
14. Exercise 1.5.4
15. Exercise 1.5.7
16. Exercise 1.5.14
17. Is $\neg p \rightarrow p$ a contradiction, tautology, or neither?
18. Show that $\neg\neg p \leftrightarrow p$ a tautology.
19. Use the above two results to prove or disprove the following:
 - (a) $\neg\neg\neg\neg\neg\neg p \leftrightarrow \neg\neg p$ is a tautology.
 - (b) $\neg\neg\neg\neg\neg\neg\neg\neg\neg\neg p \rightarrow p$ is a contradiction.
20. Derive the following equivalent rule:

$$p \rightarrow (q \rightarrow (r \rightarrow s)) \Leftrightarrow r \rightarrow (q \rightarrow (p \rightarrow s))$$

PLEASE NOTE, NO EXCEPTION

- Homework is due **before the class begins** on March 15, 2011. Late homework will not be accepted.
- You are expected to do the homework by yourself. Discussion among peers is encouraged but **copying from others is a shame**.