MA0301 ELEMENTARY DISCRETE MATHEMATICS
NTNU, SPRING 2017

1. Homework Set 2

Exercise 1. *Grimaldi's book (5. ed., Exercises 2.4, page 101): solve* **Exercise 8**

Exercise 2. *Grimaldi's book (5. ed., Exercises 2.4, page 103): solve* **Exercise 19**

Exercise 3. *Grimaldi's book (5. ed., Exercises 2.5, page 116): solve* **Exercise 8**

Exercise 4. *Grimaldi's book (5. ed., Exercises 3.1, page 135): solve* **Exercise 22**

Exercise 5. *Grimaldi's book (5. ed., Exercises 3.2, page 147): solve* **Exercise 16**

Exercise 6. *Let*
$$C := \{n \in \mathbb{N} \mid n \text{ is a multiple of } 12\}$$
and
$$D := \{n \in \mathbb{N} \mid n \text{ is a multiple of } 2 \text{ and } n \text{ is a multiple of } 6\}.$$
Which of the statements is true: $C \subset D$, $D \subset C$, $C = D$.

2. Classroom Set 2

Exercise 7. *Grimaldi's book (5. ed., Exercises 2.2, page 66): solve* **Exercise 13** *and describe* in detail in your own words *the relation with the proof of Theorem 3.4 on page 138 in Grimaldi's book (Thm. II. 15. of lecture 4).*

Exercise 8. *By using rules of inference, show that the following arguments are true:*
$$i) \; \neg(a \wedge b) \wedge (\neg c \to b) \to (a \to c)$$
$$ii) \; \neg(\neg p \vee q) \wedge (\neg z \to \neg s) \wedge ((p \wedge \neg q) \to s) \wedge (\neg z \vee r) \to r$$

Exercise 9. *Grimaldi's book (5. ed., Exercises 2.4, page 100): solve* **Exercise 1**

Exercise 10. *Grimaldi's book (5. ed., Exercises 2.4, page 100): solve* **Exercise 2**

Exercise 11. *Let*
$$C := \{n \in \mathbb{N} \mid n \text{ is a multiple of } 6\}$$
and
$$D := \{n \in \mathbb{N} \mid n \text{ is a multiple of } 2 \text{ and } n \text{ is a multiple of } 3\}.$$
Show that $C = D$.

Exercise 12. *Grimaldi's book (5. ed., Exercises 3.1, page 135): solve* **Exercise 17**