

Norwegian University of Science and Technology Institutt for matematiske fag

MA0301 Elementary discrete mathematics Spring 2017

Exercise set 2

1 Basic exercises

- [1] 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).
- 2 By using rules of inference, show that the following arguments are true:

$$i)\,\neg(a\wedge b)\wedge(\neg c\to b)\to(a\to c)$$

$$ii) \neg (\neg p \lor q) \land (\neg z \to \neg s) \land ((p \land \neg q) \to s) \land (\neg z \lor r) \to r$$

- Grimaldi's book (5. ed., Exercises 2.4, page 100): solve Exercise 1
- 4 Grimaldi's book (5. ed., Exercises 2.4, page 100): solve Exercise 2
- 5 Let

$$C := \{ n \in \mathbb{N} \mid n \text{ is a multiple of } 6 \}$$

and

 $D := \{ n \in \mathbb{N} \mid n \text{ is a multiple of 2 and } n \text{ is a multiple of 3} \}.$

Show that C = D.

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