

DISCRETE MATHEMATICS 1 (MS4111): TUTORIAL 1

1. Consider the following sets

$$A = \{1, 2, 3, 4, 5, 6, 7\}, \quad B = \{3, 5, 7, 9, 10\}, \quad C = \{2, 4, 6, 12, 14\}$$

find

- (a) $A \cap B$; $A \cap C$; $B \cap C$;
- (b) $A \cup B$; $A \cup C$; $B \cup C$;
- (c) $A \setminus B$; $A \setminus C$; $B \setminus C$;
- (d) $A \Delta B$; $A \Delta C$; $B \Delta C$.

2. If $X = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14\}$ is the universal set and A , B and C are the sets given in question 1, find the complements

$$A', \quad B', \quad C'.$$

3. Let p , q and r be three propositions and assume that p and q are TRUE and r is FALSE. Find the truth value of the following propositions.

- (a) $p \Rightarrow q$
- (b) $\bar{p} \Rightarrow \bar{q}$
- (c) $\overline{p \Rightarrow q}$
- (d) $(p \Rightarrow q) \Rightarrow r$
- (e) $(p \Rightarrow q) \wedge (q \Rightarrow r)$

4. If p , q and r are three propositions, write the truth table of the compound proposition

$$p \Rightarrow (q \Rightarrow r)$$