

## MAU22C00 - TUTORIAL 2

- 1) Prove  $A \setminus (A \setminus B) \subseteq B$ .
- 2) For each of the following statements, determine whether it is either true or false and give a brief justification for your answer:
  - (a)  $3 \in \mathcal{P}(\mathbb{N})$
  - (b)  $\{3\} \in \mathcal{P}(\mathbb{N})$
  - (c)  $\{3\} \subseteq \mathcal{P}(\mathbb{N})$
  - (d)  $\{\emptyset\} \in \mathcal{P}(\{\{\emptyset\}\})$
  - (e)  $\mathcal{P}(\mathbb{Z} \cap (2, 4)) = \{\emptyset, \{3\}\}$ , where  $(2, 4)$  means the interval with endpoints 2 and 4 on the real line.
- 3) In the country of Tannu Tuva, a valid license plate consists of any digit except 0, followed by any two letters of the English alphabet, followed by any two digits.
  - (a) Let  $D$  be the set of all digits and  $L$  the set of all letters. With this notation, write the set of all possible license plates as a Cartesian product.
  - (b) How many possible license plates are there?