

Worksheet 10: Sets

In all problems, A, B, C are sets (subsets of a universal set U).

1. Write down (using set notation) the power set of the set $A = \{\emptyset, \{\emptyset\}, 1\}$.
2. Prove that $\overline{(A \cup B)} = \bar{A} \cap \bar{B}$ (one of the DeMorgan laws for sets).
3. Prove or disprove: $(A \cup B) \setminus B = A$.

4. Suppose you have the following information about the population of the planet QE220:

- Among the inhabitants of QE220 who can watch TV, not all have antennae on their head.
- The inhabitants of QE220 that are green and do not have antennae, cannot watch TV.

Does it follow that not all the inhabitants of QE220 that can watch TV are green? Justify your answer.

Hint. Start by writing down the statement you are asked about.