

Math215: HW4

1. a) By using a truth table prove that, for sets A , B and C ,

$$(A \cap C) - B = (A - B) \cap C$$

Draw a Venn diagram to illustrate the proof.

- b) Deduce that $(A - B) \cap C = \emptyset$ if and only if $A \cap C \subseteq B$.

2. Prove that

a) $A \cap (A \cup B) = A$

b) $A \cup (A \cap B) = A$

3. Prove or disprove the following statements

a) $\forall x \in \mathbb{R}, \exists y \in \mathbb{R}, x + y > 0$

b) $\exists x \in \mathbb{R}, \forall y \in \mathbb{R}, x + y > 0$