Homework 1/9

① This is an old problem, from the time when only men served in the army. An order is issued that the barber of the brigade should be available to shave all men who do not shave themselves; but should not shave anyone in the brigade who shaves himself.

Should the barber shave himself?

What do you think about this? Is it related to the topic of the day?

1/11

① Prove $U \setminus (U \setminus V) = U \cap V$.

② $A \cap (B \setminus A) = ?$ (Express in simpler terms.)

③ Prove de Morgan's 2nd distributivity law
$$(A \cap B) \cup Z = (A \cup Z) \cap (B \cup Z),$$
in the spirit of the proof in class of the 1st law.

1/13

① For any sets A, B, X, prove $X \setminus (A \cup B) = (X \setminus A) \cap (X \setminus B)$.

Homework 1/13 Continued

② Prove that if $a, c \in \mathbb{R}$, $a \neq 0$, then the equation
$ax = c$ has a unique solution $x \in \mathbb{R}$.

③ Prove that $-0 = 0$.