MATH 102: IDEAS OF MATH

WORKSHEET 6

Problem 1. (1) Prove that $\mathbb{Q} \subseteq \mathbb{R}$.
(2) Prove that $\mathbb{R} \not\subseteq \mathbb{Q}$.

Problem 2. Prove that,

$$\left\{x \in \mathbb{R} \,\middle|\, x^2 \leqslant 1\right\} = [-1, 1]\,.$$

Problem 3. Prove that for any two sets X and Y,

$$X \cap Y \subseteq X \cup Y\,.$$

Problem 4. Prove that

$$\bigcap_{n \geqslant 1} \left[0, 1 + \frac{1}{n}\right) = [0, 1]\,.$$

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