Proof, Number Systems

Collaborators:

Prove that $\sqrt{3}$ is irrational.

Scratch Work

Proof.

$\square$

For each of the following statements, prove or give a counterexample.

   a) The product of two rational numbers is always rational.

   b) The product of two irrational numbers is always irrational.

   c) The product of two irrational numbers is always rational.

   d) The product of a non-zero rational and an irrational is always irrational.

Scratch Work

Proof.

$\square$

Prove that between any two different real numbers there is a rational number and an irrational number.

Scratch Work

Proof.

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Homework 1 problem: Let A, B be sets. Prove that $A \cup B = A$ if and only if $B \subseteq A$.

Scratch Work

Homework 1 problem: For any sets A, B, C, show $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$

Scratch Work

Homework 1 problem: Write down a careful proof of the following statement:

$$\sqrt{6} - \sqrt{2} > 1.$$

Scratch Work