ProofSpace Comprehension Quiz

Functions

Cardinality

1 Which one of the following sets is finite?

(a) $A = \{x \in \mathbb{Q} \mid x^2 > 1\}$.

(b) $\{1, 2, 3\}$

(c) $\mathbb{N}$

(d) $\mathcal{P}(\mathbb{N})$

2 Which one of the following sets is countably infinite?

(a) $\varnothing$

(b) $\{1, 2, 3\}$

(c) $\mathbb{N}$

(d) $\mathcal{P}(\mathbb{N})$

3 Which one of the following sets is uncountable?

(a) $\varnothing$

(b) $\{1, 2, 3\}$

(c) $\mathbb{N}$

(d) $\mathcal{P}(\mathbb{N})$

4 Which one of the following is the **best** statement of Cantor's Theorem?

(a) For any set A, $f : A \to A \times A$ is an injection.

(b) For any set A, $f : A \to \mathcal{P}(A)$ is never an injection.

(c) For any set A, $f : A \to \mathcal{P}(A)$ is never a surjection.

(d) For any set A, $f : A \to \mathcal{P}(A)$ is uncountable.

5 Let $B = \{x \in \mathbb{Z} \mid x^2 < 1\}$. What is $|B|$?