History of Mathematical Ideas
Quiz 11

Name:_____

You have 15 minutes to complete this quiz. If you have a question raise your hand and remain seated. In order to receive full credit your answer must be **complete**, **legible** and **correct**. Show your work, and give adequate explanations.

1. State Hilbert's first problem.

Problem #1 (the Continuum Hypothesis): Show that there is no set $S \subseteq \mathbb{R}$ such that $|\mathbb{N}| < |S| < |\mathbb{R}|$.

2. For sets A and B, define what is meant by $|A| < |B|$. (A correct answer is a statement about functions.)

$|A| < |B|$ holds iff there is a 1-1 function $f\colon A \to B$ (so $|A| \leq |B|$), but there is no 1-1, onto function $g\colon A \to B$ (so $|A| \neq |B|$).