

Reductio ad Absurdum — Proof by Contraction

Question 1 (Euclid, 300 BC). Show that there are an infinite number of prime numbers.

Question 2 (Bertrand Russell, 1901). Show that there is no set of all sets.

Question 3. Suppose that:

Among people having TV sets, there are some who are not mathematicians.

Non-mathematicians who swim every day do not have TV sets.

Can we claim that not all people having TV sets swim every day?

Question 4. If the sum of five positive whole numbers is less than 15, at least two are the same?

Question 5. What is odd about each person in a group of five shaking hands with three people in the group?