Solution to Problem # 665

Problem:

Prove or Disprove: given any set of 33 different numbers between 1 and 50, both inclusive, there is at least one pair of numbers such that one is twice the othe other.

Solution. Let $O = \{1, 3, 5, \ldots, 49\}$ and $E = \{4, 12, 16, 20, 28, 36, 44, 48\}$. The set O contains 25 odd numbers and E contains 8 numbers, so that $A = O \cup E$ contains 33 numbers and no number is twice another.

□