

## Quiz 2

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**This quiz does not count towards your grade.** It exists to simply gauge your understanding. Treat this as though it were a portion of your midterm or final exam. In this quiz, we will walk through several misconceptions.

### 1 Proofs

Prove or disprove each of the following statements.

1. Prove that on an  $8 \times 8$  chess board, there cannot exist more than 8 "peaceful" rooks. Two rooks are "peaceful" if they do not share a common row or column. A set of rooks is peaceful if all pairs in the set are peaceful.
2. We now generalize this to an  $n$ -dimensional chess board, where all dimensions have 8 slots. Prove that there still cannot exist more than 8 "peaceful" rooks, in any  $n \in \mathbb{Z}^+$  dimension. (The chess board has 2 dimensions).