Chess Covers and Tours

A cover is when a set of chess pieces is either occupying or attacking every square on the board. A full cover is when the occupied squares are also attacked.

A tour is when a piece starts on one square and moves so as to visit every square exactly once. A closed tour allows the piece to return home when it is done, so the last move is just one move away from the initial position.

Remember Knights move in a (2,1) hop, two squares in one horizontal or vertical direction and one square in a perpendicular direction. Queens move as far as they like in any straight horizontal, vertical, or diagonal line.

1. How many Queens does it take to cover the standard 8x8 chessboard?
   a. Is there a cover using the fewest possible Queens, and with none of the Queens attacking each other?
   b. Is there a full cover using the same number of Queens?

2. How many Knights does it take to cover the standard 8x8 chessboard?

3. How many Knights does it take for a full cover?

4. Demonstrate a Knight tour. Can you find a closed tour?

A safe set is when a collection of pieces are placed on the board such that none of them attack each other.

5. Can you make a safe set with 4 Queens on a 4x4 board?

6. How about with 5, 6, or 7 Queens on the 5x5, 6x6, and 7x7 board?

7. Now try 8 Queens on the 8x8 board.

8. What's the biggest safe set of Knights on the 8x8 board?