Homework 3/ **Algebraic combinatorics**

(1) Consider the puzzle explained in class, with configuration
$1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 15, 14$. Is it solvable? Explain your thoughts.

(2) Let G be a finite group of order $p^k m$, where $(p, m) = 1$. For $1 \leq l \leq k$, prove that there exists a subgroup of G of order p^l.