

Assignment 6

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Positional Games, Winter 2009-10

Quiz on Dec 1st (Tuesday) at 16:15PM

Problem 1 Prove that in the Solitaire Army puzzle one needs to have at least 20 soldiers in order to send one of them behind the enemy line by four squares.

Problem 2 Suppose that in the Solitaire Army puzzle moving a soldier diagonally is also allowed (that is, jumping over a soldier diagonally and then removing it). Prove that it is impossible to send a man nine squares beyond the enemy line.

We define $F = C_1 \wedge C_2 \wedge \cdots \wedge C_m$ to be a k -SAT formula over the variable set $\{x_1, \dots, x_n\}$ if the clauses $C_i = l_{i,1} \vee l_{i,2} \vee \cdots \vee l_{i,k}$ all contain k literals of k distinct variable (A literal is a variable x_j or its negation $\bar{x}_j$). A k -SAT formula is called *satisfiable* if there is an assignment $\alpha \in \{0, 1\}^n$ of the variables that evaluates to 1.

Problem 3 Let $m(k)$ be the largest number m , such that **every** k -SAT formula with m clauses is satisfiable. Determine $m(k)$.