

Daily Proof Questions - Induction

Assigned: 2/12/2013

Due: 2/14/2013

1) Use induction to prove that the sum of the internal angles in an n -gon is $180(n - 2)$ for all integers $n \geq 3$. You may use the fact that the sum of the internal angles in a triangle is 180° .

2) Use induction to prove that the minimum number of moves to solve the Towers of Hanoi with n disks is $2^n - 1$.

3) Use induction to prove the following summation concerning Fibonacci numbers for all positive integers n :

$$\sum_{i=1}^n F_i^2 = F_n F_{n+1}$$

4) Prove DeMorgan's Law for the complement of the or of n terms, for all $n \geq 1$. Namely, show that

$$\overline{p_1 \vee p_2 \vee p_3 \vee \dots \vee p_n} = \overline{p_1} \wedge \overline{p_2} \wedge \overline{p_3} \wedge \dots \wedge \overline{p_n}$$