Quiz #3

Tuesday, June 21 2016
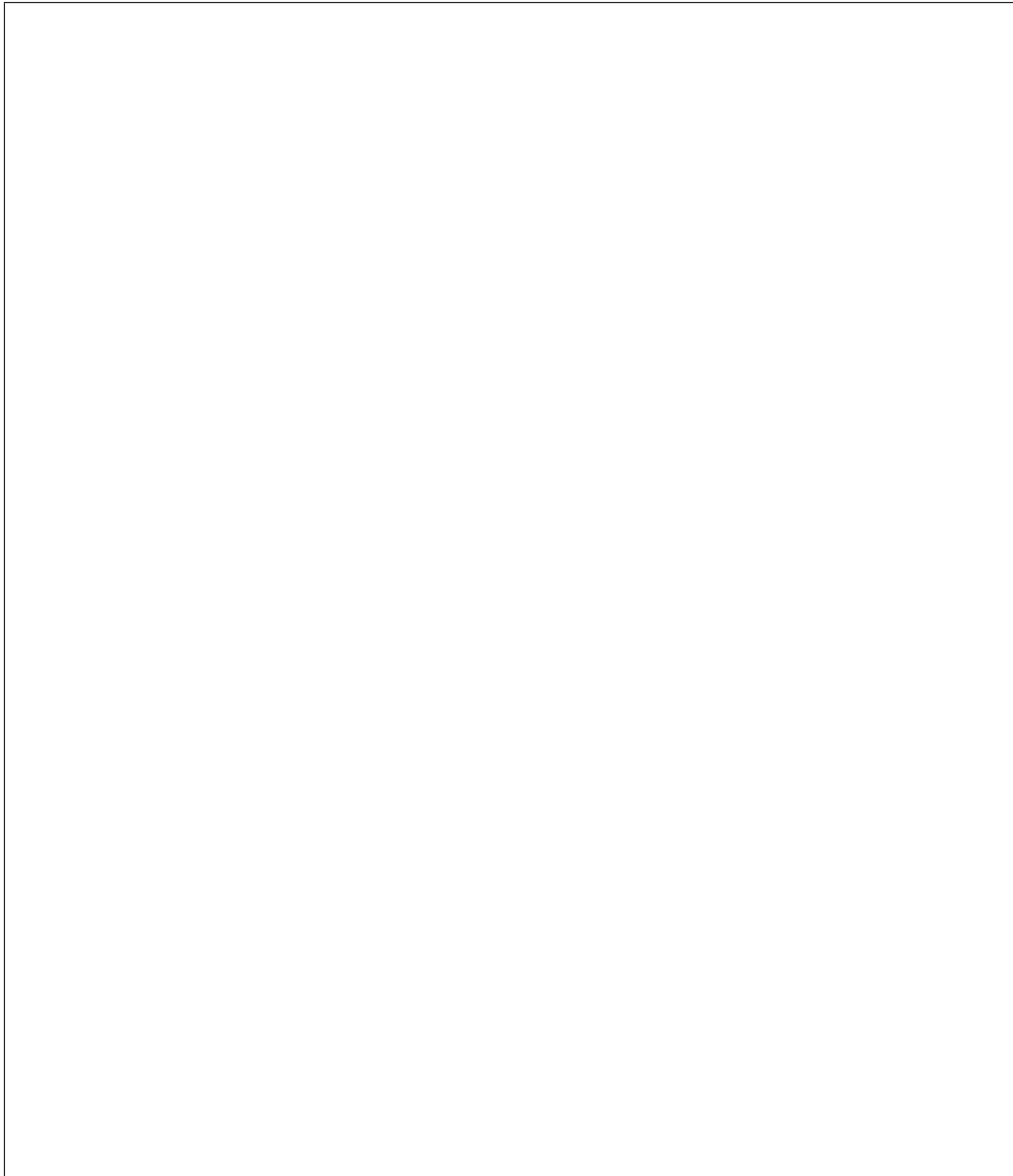
NAME: _____

Please write clearly and properly.

Problem	Grade
1	
2	
Total	

Problem 1. Write a proof of the following "theorem":

Theorem. Let $n \in \mathbb{Z}$. n is even if and only if $(n + 1)^2$ is odd.

Problem 2. Consider the sets:

$$A_0 = \emptyset$$
$$A_1 = \mathcal{P}(A_0) = \{\emptyset\}$$
$$A_2 = \mathcal{P}(A_1) = \{\emptyset, \{\emptyset\}\}$$
$$A_3 = \mathcal{P}(A_2) = \ldots$$
$$\vdots$$

In other words, $A_{n+1} = \mathcal{P}(A_n)$ for all $n \in \mathbb{N}$.

Prove the following statement: $\forall n \in \mathbb{N} \quad |A_n| = 2^{n-1}$.