Question 1

Let $A$ be a finite set having $n \geq 1$ elements and let $a \in A$. Consider the following set $C$ of subsets of $A$:

$$C = \{B \subseteq A \mid a \notin B\}.$$ 

How many elements does $C$ have? You do not have to explain your answer. Simplify your answer as much as possible.
Question 2

Prove by induction that for all $n \geq 1$,

$$\sum_{i=1}^{n} (2i - 1) = n^2.$$