

In class exercises: induction

1. A sum formula.

Prove that, for every positive integer n , $1 + 3 + 5 + \cdots + (2n - 1) = n^2$.

2. Divisibility.

Prove that, for every nonnegative integer n , $5^n - 1$ is divisible by 4.

3. An inequality.

Prove that, for every integer $n \geq 1$, $2^n \geq n + 1$.