

Tutorial Worksheet 6

1) Prove for all $n \in \mathbb{N}$,

$$1^2 + 3^2 + 5^2 + \dots + (2n - 1)^2 = \frac{4n^3 - n}{3}$$

2) Prove, by induction, that $10^n - 1$ is divisible by 11 for every even natural number n .

3) Compute the following expressions (obtain a single number).

a) $\sum_{n=1}^{100} (n \cdot (-1)^n) =$

b) $\prod_{k=1}^{69} 2^{k-35} =$

c) $\prod_{k=10}^{99} \frac{k}{k+1} =$

