Prove that sum of n first positive ~~even~~ odd number equals to n^2?

Solution:

Basis for Induction:

i) $n=1$, sum of single positive odd number is

~~2~~ $1^2 = 1$. This is true since sum of single positive odd number is 1

ii) Step for Induction:

suppose that $p(n)$ for the question

$$1+3+5+\ldots+(2n-1)=n^2$$

is true. We must show that

$$1+3+5+\ldots+(2n-1)+(2n+1)=(n+1)^2$$

is also true.

We can prove it as follows:

$$1+3+5+\ldots+(2n-1)+(2n+1) = [1+3+5\ \ldots+(2n-1)]+(2n+1)$$
$$= n^2+(2n+1)$$
$$= (n+1)(n+1)$$
$$= (n+1)^2$$

iii) Conclusion: Because basis step and induction step are both proven correct, then sum of n positive odd number is n^2.