

Theorem (2.4.21a). *The summation of odd numbers from 1 to n is n^2 .*

Proof. $\sum_{k=1}^n 2k - 1 = \sum_{k=1}^n k^2 - (k - 1)^2$. By Theorem 2.4.19, that is $n^2 - 0^2 = n^2$. Thus, $\sum_{k=1}^n 2k - 1 = n^2$, and indeed the summation of odd numbers from 1 to n is n^2 . ■