

## Sigma Notation



## Preliminaries and Objectives

Preliminaries:

- Sequences of numbers

Objectives:

- Find a sum written using Sigma Notation

## Example 1

$$\sum_{k=1}^{10} 2k$$

$$2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20 = 110$$

$$\sum_{k=0}^9 2(k+1)$$

## Example 2

$$\sum_{k=1}^5 k^2$$

$$1 + 4 + 9 + 16 + 25 = 55$$

## Example 3

$$\sum_{k=0}^3 k^3 - k^2$$

$$0 + 0 + 4 + 18 = 22$$

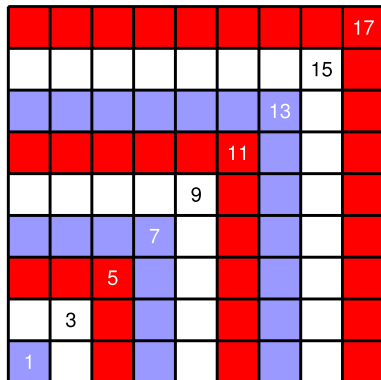
## Example 4

$$\sum_{k=1}^n 2k - 1 = n^2$$

$$1 + 3 + 5 + 7 + \dots + (2n - 1)$$

If $n = 1$	1	= 1
If $n = 2$	1 + 3	= 4
If $n = 3$	1 + 3 + 5	= 9
If $n = 4$	1 + 3 + 5 + 7	= 16
If $n = 5$	1 + 3 + 5 + 7 + 9	= 25

## Sum of the first $n$ odd integers



## Recap

$$\sum_{k=lower}^{upper} formula$$

- $\Sigma$  means find the sum
- $k$  is a variable that gets plugged into the formula
- $k$  is an integer that starts at the 'lower' summand and goes up one at a time until reaching the 'upper' summand