**Preliminaries and Objectives**

**Preliminaries:**
- Sequences of numbers

**Objectives:**
- Find a sum written using Sigma Notation

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**Example 1**

\[
\sum_{k=1}^{10} 2k = 2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20 = 110
\]

\[
\sum_{k=0}^{9} 2(k+1) = 1 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20 = 110
\]

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**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

\[\sum_{k=1}^{n} 2k - 1 = n^2\]

\[1 + 3 + 5 + 7 + \ldots + (2n - 1)\]

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

\[\sum_{k=\text{lower}}^{\text{upper}} \text{formula}\]

- \(\Sigma\) 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