

10.9 Capital Sigma (Σ) Notation

The symbol Σ means that every term is added, in a ‘series’.

last number to go in for i (called the ‘upper bound of summation’)

$$\sum_{i=1}^n 2i$$

first counting term for i (called the ‘lower bound of summation’) (i is the ‘index of summation’ here, **not** $i = \sqrt{-1}$)

$$\sum_{i=1}^{\infty} 2i = 2 + 4 + 6 + \dots + 2n + \dots$$

$$\sum_{i=1}^n 2i = 2 + 4 + 6 + \dots + 2n$$

$$\sum_{i=1}^4 2i = 2 + 4 + 6 + 8$$

$$\sum_{i=1}^3 2i = 2 + 4 + 6$$

$$\sum_{i=1}^2 2i = 2 + 4$$

$$\sum_{i=1}^1 2i = 2$$

$$\sum_{i=0}^{n-1} ax^i = ax^0 + ax^1 + ax^2 + \dots + ax^{n-1}$$

You see the ‘first counting term’ for i in this example above, is 0. This is the same as counting the first ten numbers with 0 as the first number, i.e. 0, 1, 2, 3, 4, 5, 6, 7, 8, 9. There’s ten numbers there. 0 is the first number. So when $n = 1$, you put in 0 instead of 1, for i .

$$\sum_{i=1}^n ax^i = ax^1 + ax^2 + ax^3 + \dots + ax^n$$

$$\sum_{i=2}^{n+1} ax^i = ax^2 + ax^3 + ax^4 + \dots + ax^{n+1}$$

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