Appendix E: Sigma Notation

MATH 1700

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In this section we review the notation, some properties of sums, and some formulas for particular sums.

Sigma notation for sums

When we write

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we mean

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Example:

$$\sum_{i=2}^{5}(i+3) = (2+3) + (3+3) + (4+3) + (5+3).$$

Example:

$$\sum_{i=1}^{6} i^2 = 1^2 + 2^2 + 3^2 + 4^2 + 5^2 + 6^2.$$

Properties of sums

$$\sum_{i=m}^{n} ca_i = c \sum_{i=m}^{n} a_i$$

$$\sum_{i=m}^{n} (a_i + b_i) = \sum_{i=m}^{n} a_i + \sum_{i=m}^{n} b_i$$

$$\sum_{i=m}^{n} (a_i - b_i) = \sum_{i=m}^{n} a_i - \sum_{i=m}^{n} b_i$$

Formulas for particular sums

$$\sum_{i=1}^{n} c = nc$$

$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}$$

$$\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$$

$$\sum_{i=1}^{n} i^3 = \left(\frac{n(n+1)}{2}\right)^2.$$