Appendix E

Sigma Notation

SIGMA NOTATION

A convenient way of writing sums uses the Greek letter Σ (capital sigma) is called **sigma notation**.

If $a_1, a_2, \ldots, a_n$ are real numbers, then

$$\sum_{i=1}^{n} a_i = a_1 + a_2 + \cdots + a_n$$

RULES FOR WORKING WITH SIGMA NOTATION

Theorem: If c is any constant, then

(a) $\sum_{i=1}^{n} c = n \cdot c$

(b) $\sum_{i=1}^{n} c \cdot a_i = c \cdot \sum_{i=1}^{n} a_i$

(c) $\sum_{i=1}^{n} (a_i + b_i) = \sum_{i=1}^{n} a_i + \sum_{i=1}^{n} b_i$

(d) $\sum_{i=1}^{n} (a_i - b_i) = \sum_{i=1}^{n} a_i - \sum_{i=1}^{n} b_i$

SOME SPECIAL SUMMATION FORMULAS

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

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

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