9.3 Sigma Notation

Sigma –

$$\sum_{n=1}^{4} n =$$

$$\sum_{n=2}^{6} n^2 =$$

$$\sum_{i=1}^{3} i(i+1) =$$

$$\boxed{\sum_{k=1}^{n} a_k =}$$

Write the sum using Sigma notation:

a) $\frac{1}{2} + \frac{2}{3} + \frac{3}{4} + \cdots + \frac{12}{13}$

b) $\frac{2}{3} + \frac{4}{9} + \frac{8}{27} + \cdots + \left(\frac{2}{3}\right)^n$

Properties of Sums:

$$\sum_{k=1}^{n}(a_k + b_k) = \sum_{k=1}^{n} a_k + \sum_{k=1}^{n} b_k$$

$$\sum_{k=1}^{n}(Ca_k) = C\sum_{k=1}^{n} a_k\,, \quad \text{where C is a constant}$$

$$\sum_{k=1}^{4} k^2 - 5k =$$

$$\sum_{k=4}^{7} 6k =$$

Summation Formulas:

$$\sum_{k=1}^{n} C = Cn\,, \quad \text{where C is a constant}$$

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

$$\sum_{k=1}^{n} k^2 = \frac{n(n+1)(2n+1)}{6} = \frac{2n^3+3n^2+n}{6}$$

$$\sum_{k=1}^{n} k^3 = \left[\frac{n(n+1)}{2}\right]^2 = \frac{n^2(n+1)^2}{4} = \frac{n^4+2n^3+n^2}{4}$$

$$\sum_{k=1}^{10} 4 =$$

$$\sum_{k=1}^{15} k =$$

$$\sum_{k=1}^{12} k^2 =$$

$$\sum_{k=1}^{19} k^3 =$$