
Math 112

Summation Notation and Summation Formulas

1.
$$\sum_{i=1}^5 2i =$$

2.
$$\sum_{i=1}^5 i^2 =$$

3.
$$\sum_{i=1}^5 (2i + i^2) =$$

4.
$$\sum_{i=1}^7 (4i + 2) =$$

5.
$$\sum_{k=1}^5 \frac{3}{k} =$$

6.
$$\sum_{k=1}^9 \sin k =$$

7. In the next series of exercises, you'll try to come up with a **formula** for $\sum_{i=1}^n c$, where c is any constant.

(a) $\sum_{i=1}^5 6 =$

(b) $\sum_{i=1}^7 6 =$

(c) More generally $\sum_{i=1}^n 6 =$

(d) $\sum_{i=1}^7 3 =$

(e) $\sum_{i=1}^{20} 3 =$

(f) **Summation Formula 1:** If c is any constant, then $\sum_{i=1}^n c =$

8. In the next series of exercises, you'll try to come up with a **formula** for $\sum_{k=1}^n k = 1 + 2 + 3 + \cdots + n$.

(a) $\sum_{k=1}^2 k =$

(b) $\sum_{k=1}^3 k =$

(c) $\sum_{k=1}^4 k =$

(d) $\sum_{k=1}^5 k =$

(e) $\sum_{k=1}^{10} k =$

(f) $\sum_{k=1}^{15} k =$

(g) $\sum_{k=1}^{23} k =$

(h) **Summation Formula 2:** $\sum_{k=1}^n k =$

9. **Summation Formula 3:** $\sum_{i=1}^n i^2 =$

10. In the next series of exercises, you'll work on combining the results from Summation Formulas 1, 2, and 3.

(a) $\sum_{k=1}^n (3 + 2k - 5k^2) =$

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

(c) $\sum_{k=1}^n (k^2 - k) =$