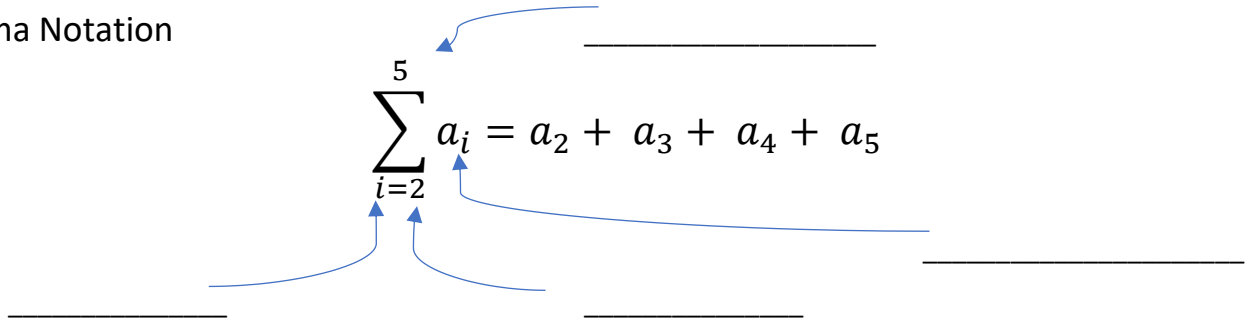
Ch. 4.2a Notes

I. Sigma Notation



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

II. Summation Formulas:

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

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

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

4) $\sum_{i=1}^{n} i^3 = \frac{n^2(n+1)^2}{4}$

5) $\sum_{i=1}^{n} c\boldsymbol{a_i} = c\sum_{i=1}^{n} \boldsymbol{a_i}$

Example 2

$\sum_{i=1}^{8} (3i^2 + 2) =$

Example 3

$\sum_{i=1}^{10} (i+2)^2 =$

Example 4

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

III. Limits as $\boldsymbol{n}$ approaches infinity

*Think back about finding horizontal asymptotes

Example 5: $If\ S(n) = \frac{1}{n^2}\left[\frac{n(n+1)}{2}\right]\ ,\ then\ find\ \lim_{n\to\infty} S(n)$

***Example* 6**: $Find\ \lim_{n\to\infty} \sum_{i=1}^{n} \left(\frac{2i}{n}\right)\left(\frac{2}{n}\right)$

***Example* 7**: $Find\ \lim_{n\to\infty} \sum_{i=1}^{n} \left(1+\frac{2i}{n}\right)^2\left(\frac{2}{n}\right)$