MTH 3318 - Homework #0 - Solutions

Fall 2022

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Instructions: Express each sum of the form $\sum_{i=1}^{n+1} a_i$ in the form $\left(\sum_{i=1}^{n} a_i\right) + a_{n+1}$

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

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

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

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

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

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

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

6. $\sum_{i=1}^{n+1} ar^{i-1} = \left(\sum_{i=1}^{n} ar^{i-1}\right) + \left(ar^{(n+1)-1}\right)$

   $= \left(\sum_{i=1}^{n} ar^{i-1}\right) + (ar^n)$