1.2 Ben Pury

1

$\sum_{i=1}^{0} i^7 = 0$ $\sum_{i=99}^{98} 2^{n \lg n} = 0$

$\sum_{i=1}^{0} 1^{243} = 0$ $\sum_{i=100}^{1} i = 0$

$\sum_{i=1000}^{263} 1^{3.14159} = 0$

2.

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

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

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

$6\left(\frac{2n^3+3n^2+n}{6}\right) + 2\left(\frac{n}{2}(n+1)\right) =$

$2n^3+3n^2+n+n^2+n = \boxed{2n^3+4n^2+2n}$

c. $\sum_{i=1}^{n}(3^i+5^i) = \sum_{i=0}^{n} 3^i + \sum_{i=0}^{n} 5^i - \left(\sum_{i=0}^{0} 3^i + \sum_{i=0}^{0} 5^i\right) = \frac{3^{n+1}-1}{2} + \frac{5^{n+1}-1}{4} - 2$

$= \boxed{\frac{2(3^{n+1})+5^{n+1}-11}{4}}$

d. $\sum_{i=0}^{n} 7^i = \frac{7^{n+1}-1}{7-1} = \boxed{\frac{7^{n+1}-1}{6}}$

e. $\sum_{i=1}^{n} 2^i = -\sum_{i=0}^{0} 2^i + \sum_{i=0}^{n} 2^i = \frac{2^{n+1}-1}{} - 1 = \boxed{2^{n+1}-2}$

f. $\sum_{i=0}^{n} 1^i = \boxed{n+1}$ g. $\sum_{i=0}^{n} 0^i = \boxed{0}$