Fall 2013
Kronenthal

# MAT 181 Section 050
# Graded Homework on Sigma Notation

1. * Prove that
$$\sum_{i=1}^{n} i = \frac{n(n+1)}{2}.$$
Hint: You may want to do this in two separate steps. First, prove it when $n$ is even. Then prove it when $n$ is odd.

2. * (Optional problem for extra credit) Prove that
$$\sum_{i=1}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}.$$
Hint: Evaluate the sum
$$\sum_{i=1}^{n} [(1+i)^3 - i^3]$$
in two ways. First, by noticing that many terms cancel. What's left? Second, by using the algebraic properties of sums, as well as the result of the previous problem.