

MAT 129
Lab #10
March 26, 2007

- (1) Use induction to show that

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

- (2) Use strong induction to show for each integer $n \geq 2$ that n has at least one prime divisor.
- (3) Use induction to show that

$$\sum_{i=0}^n i^3 = \left(\sum_{i=0}^n i \right)^2.$$

Recall that we have already seen that $\sum_{i=1}^n i = \frac{n(n+1)}{2}$.

- (4) Use induction to show that

$$\sum_{i=0}^n i(i+1) = \frac{n(n+1)(n+2)}{3}.$$

- (5) Use induction to show that

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