

Math 1200 section B - Problems, conjectures and proofs

Assigned: September 8, 2008 Due: September 15, 2008, 7pm.

- (1) complete the academic integrity tutorial at:
http://www.yorku.ca/tutorial/academic_integrity/
Include a printout of the last page showing that you have completed the tutorial.
- (2) Show that for $n \geq 0$,

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

- (3) Find a formula for the sum

$$1^3 + 2^3 + 3^3 + \dots + n^3$$

where $n \geq 1$. Justify completely why your formula is correct.

- (4) Find a formula for the sum

$$1^k + 2^k + 3^k + \dots + n^k .$$

Explain how you arrived at this formula and justify why it is true.