Math 181 Recitation 2

Due at recitation, Thurs, Aug. 30, 2007

1. Prove the formula

$$\sum_{k=1}^{n} k^3 = \Big(\sum_{k=1}^{n} k\Big)^2$$

in two ways:

(a) (Trick) By proving and using the formula

$$k^3 = \big(k(k+1)/2\big)^2 - \big((k-1)k/2\big)^2.$$

(b) (Systematically) Start by expanding $k^4 - (k-1)^4$.

Remark. If you have trouble figuring out what the $\sum$ notation is expressing, try working it out explicitly for some low values of n (like 1, 2, 3).

2. p. 393, #69.

3. p. 423, #44.

4. p. 423, #45.