



These are the solutions to the summations found in all of the versions of the first quiz. I expect that everyone can do the substitution of letters needed. These formulas are right out of chapter 1 notes.

1. $\sum_{k=0}^M 2k = 2 \cdot \sum_{k=0}^M k = 2 \cdot M(M+1)/2 = M(M+1).$

Naturally this can be generalized to any constant multiple:

$$\sum_{k=0}^M ak = a \cdot \sum_{k=0}^M k = a \cdot M(M+1)/2$$

2. $\sum_{n=0}^M n^2 = \frac{M(M+1)(2M+1)}{6}$

3. $\sum_{k=0}^{n-1} a^k = \frac{a^{n-1+1}-1}{a-1} = \frac{a^n-1}{a-1}$