Write your name and code on the back.

Show your work!

1. { 10 points } **Give a combinatorial proof that if n is a positive integer, then**

$$\sum_{k=0}^{n} k\binom{n}{k} = n2^{n-1}$$

[*Hint:* Show that both sides count the ways to select a subset of a set of n elements together with one element of this subset.]