

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.]