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Discrete 2824

Challenge problems

Challenge set #2

#1. We start with a pile N, this pile is larger than any previously computed pile so we must prove that our equation (n(n-1))/2 is true for all N. We split this pile into piles n & m where n, m>0 and n+m=N. the result of pile n is the same for all trivial piles and thus pile m = (m(m-1))/2 and the total is nm + (n(n-1))/2 + (m(m-1))/2. We can simplify this as ((n+m)(n+m-1))/2 which is equal to (N(N-1))/2 and thus we prove for all N.

#2. This solution is similar to #1 but with the fact that N = (1/n)+(1/m) which is equal to nm/nm = 1 = N so for any N we will get back nm/nm = N.