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CS200

Homework #12

Question #1:

In order to prove is divisible by 5, we must prove the base case when n = 0. In this case, simplifies to 0 and 0 is divisible by 5. Next, we must prove that the statements holds when n is set to n + 1. When we replace n for n + 1 we get which can also be written as and also written as . This can be simplified to We have already proven that is divisible by 5 and 5 divided by 5 is Because all of the terms in the simplified expression are divisible by 5, our statement still holds and therefore by induction, is divisible by 5.

Question #2:

Base case: S = 0, . Inductive case: and = base case. Therefore, for every increment of s + 1, the amount of possible permutations in a set is multiplied by 2.