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CS200

Midterm#2 Question 11 Proof:

We will prove that “for all integers n with ” by induction on n.

Base case: n = 2: which simplifies to which holds.

Inductive hypothesis: n > 2 or n + 1: we can also write this as . Since we have already proven for the base case, we can simplify our expression by subtracting and by the left side of the equation and by the right side of the equation because if we know to be true for the base case then must also be true. We are now left with and since we have proven then must also hold.

Conclusion: Because we have proven that for all integers n with when n = 2 at the base case and when n = n +1 in the recursive case, we have proven that “for all integers n with ” by induction on n.