CS3345 Exam 1

Question 1

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Prove that the sum from i=1 to n of (2i-1) equals n\*n

Basis step: n = 1, sum 2(1)-1 = 1, 1\*1=1, so it is true for basis n=1

Inductive step: assume true for k

Sum from i=1 to k of (2i-1) = k\*k

Show true for k+1:

k\*k + 2(k+1)-1 = (k+1) \* (k+1)

k\*k + 2(k+1)-1 = k\*k + (k) + (k+1)

2(k+1)-1 = k + k + 1

2k + 2 – 1 = 2k + 1

2k +1 = 2k +1

Conclusion: by induction, the statement is true for all n>=1