Dean Smith

CS200

Quiz #4 Proof for Question #2

We can prove the theorem: “for all non-negative integers k and all integers is a multiple of ” by induction. In order to prove this theorem by induction we must first prove the base case (when k = 0). When k = 0, the expression simplifies to and multiplied by 0 will always be 0, therefore, the base case holds. Next we must test the recursive case, or when k = k + 1. When k = k + 1, the expression simplifies to which is a multiple of ) because . Therefore, the recursive case holds and hence, we have proven the theorem by induction.