187 §3- DISCRETE MATHEMATICS - Quiz 8

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Name _____

1. Please explain in your own words, intuitively, why the method of mathematical induction works.

2. (This problem is solved in the book. Please do it on your own.)

   Use induction to prove that for all $n \geq 1$,

   $$1 + 2 + \cdots + n = \frac{n(n+1)}{2}.$$

3. **Definition.** Two integers a and b are said to be *relatively prime* iff the only positive integer c that divides both of them is $c = 1$.

   For example, 3 and 17 are relatively prime, as are 15 and 292, or 8 and 9, or 25 and 26.

   Recall that the Fibonacci numbers are given by $F_1 = 1$, $F_2 = 1$, and $F_{n+1} = F_n + F_{n-1}$ for $n > 1$. Prove by induction that, for all $n \geq 1$, the Fibonacci numbers F_n and F_{n+1} are relatively prime.