1. What is the well-ordering property of \( \mathbb{N} \)?

2. Let \( P(k) \) represent a statement that depends on \( k \). Assume that we know that \( P(1) \) is a true statement and that \( \forall k : P(k) \Rightarrow P(k + 1) \) is a true statement. Using the truth table for \( P(k) \Rightarrow P(k + 1) \), if \( P(k) \) is true, how do we know that \( P(k + 1) \) is true?

3. Is there a volunteer to prove that \( 2 + 5 + 8 + \cdots + (3n - 1) = \frac{n(3n+1)}{2} \) for all integers \( n \geq 1 \)?

4. Is there a volunteer to prove that if \( 1 + x > 0 \) then \( (1 + x)^n \geq 1 + nx \) for all integers \( n \geq 1 \)?
Homework for Section 10, due ??? (only the starred problems will be graded):

1, 2, 3*, 6, 7, 21*, 22*

Hints: