P1 Let T_n be a recurrence defined as follows:

$$T_0 = 1, \ T_{n+1} = (n+1) + \frac{1}{2}T_n, \ n \in \mathbb{N}.$$

We wish to prove that $T_n \geq 2n + 1$ for all $n \in \mathbb{N}$.

Proof: Proof is by weak induction on n.

Base Case: (Write down and verify base case)

Answer

Ind. Hyp. (Write down the statement of the ind. hyp.)

Answer

Proof of Ind. Hyp.

(prove the ind. hyp.)

Answer

P2 Let F_n, $n \geq 0$ be the Fibonacci series. **Theorem:** For all $n \in \mathbb{N}$, $\sum_{j=0}^{n} F_j = F_{n+2} - 1$.

Proof: Proof is by **weak induction** on n.

Base Case: (Write down and verify base case)

Answer

Ind. Hyp. (Write down the statement of the ind. hyp.)

Proof of Ind. Hyp.

(prove the ind. hyp.)

Answer

P3 Let F_n, $n \geq 0$ be the Fibonacci series.
Theorem: For all $n \in \mathbb{N}$, If $n \geq 2$ then $F_n \geq 1.2^n$.
Proof: Proof is by **strong induction** on n.

Base Case:

(Write down and verify base case)

Answer

Ind. Hyp.

(Write down the statement of the ind. hyp.)

Answer

Proof of Ind. Hyp.

(prove the ind. hyp.)

Answer