

Math Homework

1) From the definition of O , we need to show

$$\exists n_0 > 0. \exists c > 0. \forall n > n_0. a_n \leq c \cdot 2^n.$$

Choosing $c = 4$ and $n_0 = 0$, we need to show $a_n \leq 4 \cdot 2^n$ for every $n \geq 0$, which is true by part a).

2) a) $(6)(20) = 120$

b) \sqrt{x} is irrational.

Problem 3

$$(\exists a, b \in \mathbb{N}. 2025^a + 1 = 18062b) \Rightarrow (\exists a, b \in \mathbb{N}. a = 2b)$$

Since $P \Rightarrow \text{True}$ is always True, the statement is true.