

Math 3100 Quiz 4

Name _____

1. (5 points) Let $x \in \mathbb{R}$. Use induction to prove that

$$(1 + x)^n \geq 1 + nx$$

for all $n \in \mathbb{N}$.

2. (5 points) Let $\{a_n\}$ be a sequence.

(a) Write down the definition of the following two statements:

i. $\lim_{n \rightarrow \infty} a_n = 0$

ii. $\lim_{n \rightarrow \infty} |a_n| = 0$

(b) Use part (a) above to conclude that

$$\lim_{n \rightarrow \infty} a_n = 0 \quad \text{if and only if} \quad \lim_{n \rightarrow \infty} |a_n| = 0.$$