Calculus and Linear Algebra II

Quiz 1

Instructions:

- Do all the work on this quiz paper.

- Show your work, i.e., write down the steps of your solution cleanly and readable.

- Electronic devices and notes are not allowed.

Name: _____

Problem 1 [5 points]

(a) Write down the formula for the binomial expansion:

$$(a+b)^n = \sum_{k=0}^{n} \boxed{}$$

(b) Explicitly compute $\binom{10}{2}$.

Problem 1 (extra space)

Problem 2 [10 points]

(a) What is the value of the sum $\sum_{k=0}^{N} x^k$?

(b) For which x does $\sum_{k=0}^{\infty} x^k$ converge? For which x does it diverge?

(c) Apply the ratio test to $\sum_{k=1}^{\infty} \frac{k^3}{k!}$ in order to determine whether this series converges or diverges.

(d) Determine the radius of convergence of $\sum_{k=0}^{\infty} \frac{x^k}{k!}$

Problem 2 (extra space)