Your Name: _____

Your Partner: _____

Quiz 6

Math 253

You have 20 minutes to complete this quiz. When you're finished, first check your work if there is time remaining, then turn it in. You may use a scientific calculator, but not a graphing one, and not any internet-connected device. You may work with one other student. **Enough work should be shown that there is no question about the mathematical process used to obtain your answers.**

1. (8 points) Determine the first three terms of $\left(\sum_{n=0}^{\infty}(n+1)x^n\right)\left(\sum_{k=0}^{\infty}2^k x^k\right)$ and determine the interval of convergence of the product.

2. (12 points) Find the exact value of the series $\sum_{n=1}^{\infty} \frac{1}{n}\left(\frac{1}{3}\right)^n$ by writing it as $f\left(\frac{1}{3}\right)$, where $f(x) = \sum_{n=1}^{\infty} \frac{1}{n}x^n$, and using calculus on $f(x)$.