MATH/STAT 394: Math Diagnostic

This quiz is intended solely to help assess your mathematical preparation for 394. It will be self-graded and the grade will not be recorded. If the questions are unfamiliar to you, you should consider taking preparatory courses in calculus before taking 394.

1. \( \int_{0}^{1} e^{-2x} dx = \)

2. \( \frac{d}{dx} \frac{1}{1-x} = \)

3. For \(|x| < 1\), \( \sum_{k=0}^{\infty} x^k = \)

4. For \(|x| < 1\), \( \sum_{k=0}^{\infty} kx^{k-1} = \)

5. Define \( f(x, y) = \begin{cases} 1, & \text{if } 0 < x < y < 1 \\ 0, & \text{otherwise} \end{cases} \).

\[ \int \int f(x, y) dx dy = \]