You will have twenty minutes to take this quiz. Read the instructions carefully. There are more questions on the back of this page.

1. (4 points) You do not need to show your work. Only the answer will be graded.
For each of the following, circle true or false:

\[
\lim_{n \to \infty} \frac{14n + 2 + 7^n}{100n^7 + 6n - 2} = 0 \quad \text{True} \quad \text{False}
\]

\[
\lim_{n \to \infty} \sum_{k=1}^{n} \left(\frac{-1}{2}\right)^k \quad \text{exists and is finite.} \quad \text{True} \quad \text{False}
\]

\[
\lim_{n \to \infty} \sum_{k=1}^{n} \frac{k}{2^k} \quad \text{exists and is finite.} \quad \text{True} \quad \text{False}
\]

\[
\lim_{n \to \infty} \frac{8 - 15n^2}{n^2 - n + 6} = 15 \quad \text{True} \quad \text{False}
\]
2. (6 points) Show your work. Partial credit may be awarded. 

Find a bound on \( R_n e^x \) which is valid for \( x \) satisfying \(-2 \leq x \leq 0\) and use this to show that 
\[
e^{-2} = \sum_{k=0}^{\infty} \frac{(-2)^k}{k!}.
\]