MATH 1953 Practice Midterm 3

Name: _____

Instructions: Please answer each question as completely as possible, and show all work unless otherwise indicated. You may use an approved calculator for this quiz. (Approved: non-graphing, non-programmable, doesn't take derivatives)

1. Find the value of the convergent infinite series $\sum_{n=3}^{\infty} \frac{4}{n^2+6n+8}$ by using partial fractions to rewrite it as a telescoping series.

2. Use the Integral Test to decide whether the infinite series

$$\sum_{n=1}^{\infty} \frac{2n}{n^2+1}\, dx$$

converges or diverges. DO NOT attempt to find the exact value of the series!

3. Using either the Comparison Test or Limit Comparison Test, decide whether the infinite series

$$\sum_{n=1}^{\infty} \frac{3^n - 2}{4^n + 5}\, dx$$

converges or diverges. DO NOT attempt to find the exact value of the series!

4. (a) Use the Alternating Series Test to decide whether the infinite series

$$\sum_{n=1}^{\infty}(-1)^n \frac{1}{n!}\, dx$$

converges or diverges. DO NOT attempt to find the exact value of the series!

(b) Give a partial sum which approximates the infinite series from (a) to within $\frac{1}{100}$. (A basic calculator may be useful for this!)