Math 231 Exam #2 Spring 2007

1. (20 pts) Determine the limit of each sequence if it converges, or explain why it diverges.
   (a) \( \lim_{n \to \infty} \frac{6n + 5}{11n - 1} \)
   (b) \( \lim_{n \to \infty} \frac{(\ln n)^2}{n^{1/10}} \)

2. (20 points) Find the sum of each series. Hint: first find a formula for the partial sums.
   (a) \( \sum_{n=1}^{\infty} \frac{5}{2n+3} \)
   (b) \( \sum_{n=1}^{\infty} \left( \frac{1}{\sqrt{n}} - \frac{1}{\sqrt{n+1}} \right) \).

3. (24 pts) For each series, determine whether it converges or diverges. Say what tests you use.
   (a) \( \sum_{n=1}^{\infty} \frac{n}{n^3 + 2} \)
   (b) \( \sum_{n=1}^{\infty} \frac{2007^n}{\sqrt{n!}} \)

4. (24 pts) For each series, classify it as either conditionally convergent, absolutely convergent, or divergent.
   (a) \( \sum_{n=1}^{\infty} \frac{(-1)^n}{n + 2007} \)
   (b) \( \sum_{n=1}^{\infty} (-1)^{n+1} \left( 1 - \frac{1}{n} \right) \)

5. (12 pts) Classify the series as either conditionally convergent, absolutely convergent, or divergent.
   \( \sum_{n=1}^{\infty} n \left( -\frac{1}{2} \right)^n \)