Math 102, Fall 2007: Practice Exam 3 for the Second Midterm

Instructions: This is a practice exam for the second midterm. The first exam will be a 50 minute closed-book exam. Calculators are not allowed and will not be necessary. Partial credit will be awarded for partially correct solutions, so we advise you to **show all work.**

We suggest that you take this practice exam under the conditions listed above for the second midterm. Once you are done, check your answers against the answer key provided, and make corrections as necessary. Please contact your instructor or one of the teaching assistants if you have any questions.

1. Determine whether the given infinite series converges or diverges. If it converges, find its sum.
$$\sum_{n=0}^{\infty}\left[\left(\frac{1}{2}\right)^n+\left(\frac{2}{3}\right)^n+\left(\frac{3}{4}\right)^n+\left(\frac{4}{5}\right)^n+\left(\frac{5}{6}\right)^n\right]$$

2. Find the third degree Taylor formula for $f(x)=\sqrt[3]{1-x}$ at $a=-7$.

3. Use the integral test to test the given series for convergence.
$$\sum_{n=1}^{\infty}\frac{7^{(n^{-2})}}{n^3}$$

4. Use comparison tests to determine whether the following infinite series converges or diverges.
$$\sum_{n=2}^{\infty}\frac{n^2+3n-7}{n^4-2}$$

5. Determine whether the given series converges absolutely, converges conditionally, or diverges.
$$\sum_{n=1}^{\infty}\frac{3^{2n+7}}{2^{3n+\ln n}}$$

6. Find the interval of convergence of the following power series.
$$\sum_{n=1}^{\infty}\frac{(-4)^n}{n^2}(x+3)^{2n}$$