

## Math 102 Practice #3 for Exam 2

Spring 2008

1. Find the Taylor series for  $f(x) = \frac{1}{1-x}$  at  $a = 0$ .
2. Determine whether the infinite series  $\sum_{n=0}^{\infty} \left(-\frac{7}{9}\right)^n$  converges or diverges.  
If it converges, find its sum.
3. Determine whether the following infinite series converge or diverge.
  - (a)  $\sum_{n=0}^{\infty} (-1)^n \left(\frac{3}{e}\right)^n$ .
  - (b)  $\sum_{n=1}^{\infty} \frac{7^{1/n^2}}{n^3}$ .
  - (c)  $\sum_{n=1}^{\infty} \frac{7n^3 + 2n + 3}{n^3 5^n + 1}$ .
4. Use the Taylor series for  $e^x$  to find a power series representation for  $1 - e^{2x}$ .
5. Consider the series  $\sum_{n=1}^{\infty} \frac{3^{2n+7}}{2^{3n+\ln n}}$ . Does it converge? Does it converge absolutely?
6. Find the interval of convergence of the power series  $\sum_{n=1}^{\infty} \frac{(-4)^n}{n^2} (x+3)^{2n}$ .