

MA 2733

Worksheet 4 – November 19, 2012

Name \_\_\_\_\_

1. (a) Find a power series representation (around  $a = 0$ ) for the function  $\frac{d^3}{dx^3} \left( \frac{x^2}{1-x} \right)$ .

(b) Write the partial sum of the first four terms of your power series from part (a).

(c) Find the coefficient of  $x^{100}$  and of  $x^{101}$  in your power series from part (a).

2. Suppose that  $f(x)$  has a power series representation  $\sum_{n=0}^{\infty} c_n x^n$ . Write  $f(0)$ ,  $f'(0)$ ,  $f''(0)$  and  $f^{(3)}(0)$  in terms of the  $c_n$  coefficients.