Math 21C **Practice Midterm 2** **Summer 2014**

NAME(print in CAPITAL letters, first name first): _____

NAME(sign): _____

ID#: _____

Instructions: There are six problems. Make sure that you have all 6 problems.

Points received:

1	
2	
3	
4	
5	
6	
TOTAL	

1. (24 points.) Suppose that $|x| < 1$. Find the sum of the series

$$2x - 4x^3 + 6x^5 - 8x^7 + \cdots$$

2. (24 points.) Use series to estimate the following integrals to within 10^{-8}.

(a) $\int_0^{0.1} \cos x^2 \, dx$

(b) $\int_0^{0.1} e^{-x} \, dx$

3. (24 points.)

(a) Find the Maclaurin polynomial of order 6 for $\cos x$.

(b) Use your answer from part (a) to estimate cos(1).

(c) Find an upper bound for the error of your estimate in part (b). Use the alternating series approximation.

4. (24 points.) Let $f(x) = x^2 e^{-x^2}$.

(a) Find the MacLauren series for $f(x)$.

(b) Find $f^{(7)}(0)$.

(c) Find $f^{(8)}(0)$.

(d) Find $f^{(9)}(0)$.

5. (24 points.) Consider the plane that passes through the points $(1, 0, 0), (1, 1, 0)$, and $(2, 1, 1)$.

   (a) Find a vector normal to the plane.

   (b) Find an equation for the plane.

6. (12 points.) Find parametric equations for the line containing $(1, 2, 8)$ and $(3, -4, 2)$.