Calculus II, Exam IV, Spring 2013

Name:_____

Student signature:_____

Show all your work and give reasons for your answers. Good luck!

(1) (6 points) Find the sum of the series or state it diverges $\sum_{n=0}^{\infty} 5^n = 1 + 5 + 5^2 + 5^3 + \ldots$

(2) (10 points)Test the following series for absolute or conditional convergence, or divergence: $\sum_{n=1}^{\infty} \frac{(-1)^n n^3}{n^5+6}$

(3) (12 points) Find the interval and radius of convergence for $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}(2x-3)^n}{\sqrt{n}}$.

(4) (18 points) Find the MacLaurin series and state the radius of convergence for $f(x) = \arctan(2x)$.

(5) (18 points) Find the MacLaurin series and state the radius of convergence for $g(x) = \frac{x^6}{5-x}$.

(6) (18 points) Use a MacLaurin series to evaluate $e^{-(1/10)}$ with an error less than 10^{-5}. **[You do not have to add the terms in the finite sum !]**

(7) (18 points) Use the MacLaurin series to approximate $\int_0^{1/10} e^{-(x^2)} \, dx$ with an error less than 10^{-5}. **[You do not have to add the terms in the finite sum !]**

Scratch paper