Calculus II, Exam IV, Fall 2013

Name:_____

Student signature:_____

Show all your work and give reasons for your answers. In case of convergence of series state absolutely convergent, conditionally convergent, or divergent. Good luck!

(1) **[13 points]** Test the series for convergence (you must justify your answer). $\sum_{n=1}^{\infty} \frac{(-1)^n}{\sqrt{n}}$.

(2) **[13 points]** Test the series for convergence (you must justify your answer). $\sum_{n=1}^{\infty} (-1)^n \frac{5^n}{n!}$.

(3) [**13 points**] Use a series to approximate $e^{(-\frac{1}{10})}$ with an error less then 10^{-4}. [**Do not add the numbers in the sum!**]

(4) [**20 points**] Find the interval and radius of convergence of the power series $\sum_{n=1}^{\infty} \frac{(x+2)^n}{\sqrt{n}}$. Don't forget to test the endpoints.

(5) **[21 points]** Approximate the value of the integral with an error less than 10^{-10}:

$$\int_0^{(1/10)} \sin(x^4)\, dx$$

. **[Do not add the numbers in the sum!]**

(6) **[20 points]** Find the Maclaurin series of $f(x) = \frac{x^3}{2+x^7}$. Also state the interval and radius of convergence.