# Quiz 4, Calculus 2 – Regular

Dr. Adam Graham-Squire, Spring 2020

**Name:** _____

1. (3 points) Find the interval and radius of convergence of $\displaystyle\sum_{n=1}^{\infty} (-1)^n \frac{x^n}{\sqrt[3]{n}\, 5^n}$

2. (3 points) Find the Taylor polynomial, up to the fourth term, for $f(x) = \sqrt{x}$ centered at $a = 1$ (in other words, find $T_3(x)$). Note: the general form for a Taylor series is $\sum_{n=0}^{\infty} \frac{f^n(a)}{n!}(x-a)^n$. You do NOT need to multiply (FOIL) out each term, but you should calculate the coefficient for each term.

3. (4 points) (a) Find a power series representation for $\int \sin(x^2)\,dx$. (Hint: use the Maclaurin series for $\sin(x)$).

   (b) Briefly explain what is the benefit of using a power series to calculate the integral of $\sin(x^2)$.