MA 163 Exam 3

1. Use integrals to estimate the series below to within 0.005 of the actual value.

$$\sum_{n=4}^{+\infty} \frac{1}{n^3}$$

2. Find the third degree Taylor polynomial for $x^{4/3}$ about $x = 1$.

3. The Maclaurin series for $\sin x$ is below.

$$x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \cdots = \sum_{n=0}^{+\infty} \frac{(-1)^n}{(2n+1)!} x^{2n+1}$$

Find the interval of convergence.

4. Estimate to within 0.01 of the actual value..

$\sin\left(\frac{1}{2}\right) =$

5. Use a sixth degree Taylor polynomial to estimate

$$\int_0^1 \frac{\sin(x^2)}{x}\,dx =$$

6. Find the interval of convergence of

$$\sum_{n=1}^{+\infty} \frac{(-1)^n}{n2^n}(x-5)^n$$

7. Find the Maclaurin series for the function below and use it to give a series that converges to 2.

$$f(x) = \frac{1}{1-x}$$

8. Prove that $e^{i\pi} = 1$