MAT 1322 Summer <u>**Assignment 4**</u> (Due THU. June 23rd at 19:00)

No late Assignments!!! **Student Number**:

1. Starting from the Maclaurin series for $\dfrac{1}{1-x}$, find the Maclaurin series of (i) $\ln(1+3x^2)$ and

(ii) $\displaystyle\int \ln(1+3x^2)\,dx$ and give their **intervals** of convergence.

Work:

Answers:

2. Using the definition (and a test), find if the following series is absolutely convergent or not:

$$\sum_{n=2}^{\infty} \frac{\sin(6n)}{4^n}$$

Work:

Answer:

3. Assume that the series $\sum_{n=1}^{\infty} a_n x^n$ is convergent when $x = -3$, and it is divergent when $x = 20$.

(a) Is the series $\sum_{n=1}^{\infty} a_n(-2)^n$ divergent?

(b) Is the series $\sum_{n=3}^{\infty} a_n 24^n$ convergent?

Work:

Answers: (a)   (b)

4. Find the radius and interval of convergence of the power series.

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{(-1)^{n+7}(x-2011)^{n+1}}{(n+20)!}$

(b) $\displaystyle\sum_{n=2}^{\infty} \frac{(-1)^{n+2011}(x-2011)^{n+3}}{2011^{n+1} n^{10}}$

Work:

Answers: (a)   (b)