MATH-1020 F'14
Exam 2 Name: _____

1. Determine if the following converge or diverge.

a) $a_n = \sqrt{\dfrac{3n}{n+3}}$

b) $\displaystyle\sum_{n=0}^{\infty} \frac{e^n}{2+e^n}$

c) $\sum_{n=0}^{\infty} \frac{(-1)^n}{2+n^2}$

d) $\sum_{n=0}^{\infty} \frac{(-1)^n}{e^n}$

2. The following series converges (you do not need to show this). Determine how many terms are needed in order to approximate the sum with an error of less than 10^{-4}.

$$\sum_{n=0}^{\infty} \frac{(-1)^n}{1+2n}$$

3. What is the interval of convergence for the Taylor series $\displaystyle\sum_{n=0}^{\infty} \frac{(-1)^n (x-2)^{2n+1}}{2n+1}$.

4. Let $f(x) = \ln(2 + x)$.
a) Find the quadratic approximation $P_2(x)$ of $f(x)$ at $x = 0$.

b) Estimate the error if $P_2(x)$ is used to estimate the value of $f(x)$ when $|x| < 1$.