MAT 127 Final II (Practice Exam)

Last Name: _____ First Name: _____ Student ID: _____

Problem	1	2	3	4	5	6	Total
Points	10	30	20	10	20	10	100
Scores							

This midterm has five problems, weighted as shown. Please show your work – full credit may not be given if only the answers appear. **No calculators or books will be allowed on this test.** When calculating indefinite integrals, the answers should be in explicit forms, unless otherwise stated.

1. Determine whether the sequence converges or diverges, if it converges, find the limit.

$$a_n = e^{1/n}.$$

2. Determine whether the series is convergent or divergent.

   (a)

   $$\sum_{n=1}^{\infty} \frac{n^2}{n^3 + 1}$$

(b)

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

(c)

$$\sum_{n=1}^{\infty} \frac{n^2 - 5n}{n^3 + n + 1}$$

3. Determine whether the series is absolute convergent, convergent, or divergent.

(a)

$$\sum_{n=1}^{\infty}(-1)^n \frac{3n-1}{2n+1}$$

(b)

$$\sum_{n=1}^{\infty} \frac{10^n}{(n+1)4^{2n+1}}$$

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

$$\sum_{n=1}^{\infty} \frac{(4x + 1)^n}{n^2}$$

5. Find a power series representation centered at 0 for the following functions

(a)

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

(b)

$$f(x) = \frac{1+x}{(1-x)^2}$$

6. Find the Taylor series for $f(x) = e^x$ centered at $a = 3$.