

Test 3a

Math 175, Calculus II, Spring 2012

Section: 01

Name: _____

This test is closed book and closed notes. Calculators of any kind are **not** allowed. You must clearly show your work to receive credit. Unless otherwise stated, you do not need to simplify your answer.

1. Find $\lim_{n \rightarrow \infty} \frac{n^3}{3n^3 + 4}$. (11 points)

2. Find $\sum_{k=1}^{\infty} e^{-2k}$. (11 points)

For Problems 3-7, you **must state which convergence test you are using**.

3. Does $\sum_{k=2}^{\infty} 2ke^{-k^2}$ converge or diverge? (11 points)

4. Does $\sum_{k=0}^{\infty} \frac{k^3 + 5k + 3}{k^4 + 1}$ converge or diverge? (11 points)

5. Does $\sum_{k=1}^{\infty} (-1)^k \frac{1}{k}$ converge? If so, does it converge absolutely? (11 points)

6. Does $\sum_{k=5}^{\infty} \frac{e^k}{(k+1)!}$ converge or diverge? (11 points)

7. Does the series $\sum_{k=1}^{\infty} \left(\frac{3k^2 - 5k}{2k^2 + 3k + 1} \right)^k$ converge or diverge? (11 points)

8. Find the third order Taylor polynomial $p_3(x)$ for $f(x) = e^{2x}$ centered at $a = 0$. (11 points)

9. Find the radius of convergence R and interval of convergence I for the power series $\sum_{k=0}^{\infty} (-1)^k \frac{x^{k+1}}{k+1}$. (11 points)