Test 4a 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 the Maclaurin series for $f(x) = e^{x^2}$. (10 points)

2. Find the Taylor series centered at $a = \ln 3$ for $f(x) = e^x$. (10 points)

3. Find $\lim_{x \to 0} \dfrac{\sin x}{x}$ by using Maclaurin series. (10 points)

4. Find $\displaystyle\int_0^1 \cos(x^2)\, dx$ by using Maclaurin series. Your answer will be an infinite series. (10 points)

5. Eliminate the parameter t in the parametric equations $x = e^{2t}$, $y = e^t + 1$ to find the corresponding Cartesian equation. (10 points)

6. Find parametric equations that give a circle centered at $(3, 3)$ with radius 2. (10 points)

7. Find $\dfrac{dy}{dx}$ in terms of t for the parametric equations $x = \cos t$, $y = 8 \sin t$. (10 points)

8. Convert the polar equation $1 = r^2 \sin\theta \cos\theta$ into a Cartesian equation. (10 points)

9. Find the slope of the graph of $r = \theta$ at $\theta = \dfrac{\pi}{2}$. (10 points)

10. Graph $r = \sin 2\theta$ and find the area inside of one leaf. (10 points)