

Math 124
Exam 2
May 16th, 2007

Name: _____

1. Your exam contains 4 questions and 5 pages; Please make sure you have a complete exam.
2. The entire exam is worth 100 points. Point values for problems vary and these are clearly indicated. You have 50 minutes for this exam.
3. Make sure to ALWAYS SHOW YOUR WORK; you will not receive any partial credit unless all work is clearly shown. If in doubt, ask for clarification.
4. If you need extra space, use an extra sheet attached to the back of the exam and clearly indicate this.
5. You are allowed one 8.5×11 sheet of handwritten notes (both sides). Graphing and scientific calculators are allowed on the last 3 questions of the exam.
6. Leave numerical answers in exact form (as simplified as possible) or round to 4 decimal places.

Problem	Total Points	Score
1	55	
2	15	
3	15	
4	15	
Total	100	

1. (55 pts.) Evaluate the following.

(a) (10 pts.) For $g(x) = \frac{2\ln(x)+6}{-x^2+3x}$, find $g'(x)$.

(b) (7 pts.) $\frac{d}{dx}[\ln(e^2 - 1)] = ?$

(c) (10 pts.) For $f(t) = 3e^t$, find $f''(t)$.

(d) (8 pts.) Find the 37th derivative of $\sin 5x$.

(e) (10 pts.) $\frac{d}{d\theta}[4 \sec^2(5 + 2\theta)] = ?$

(f) (10 pts.) Find $\frac{dy}{dt}$ for $y = (t + 2)^{\tan t}$.

2. (15 pts.) The amount of water in a reservoir in millions of gallons is given by $w = f(t) = \sqrt{300t - 5t^2}$ on a given day t with $0 \leq t \leq 60$.

(a) (5 pts.) How much water is in the reservoir on day 50?

(b) (10 pts.) Is water flowing into or out of the reservoir on day 50 and at what rate?
(Include units on the rate of water flow.)

3. (15 pts.) $f(x) = \arccos x = \cos^{-1}x$

(a) (5 pts.) For what x -value is $f(x) = \frac{\pi}{3}$?

(b) (10 pts.) Find an equation for the tangent line of f at the x -value found in part (a).

4. (10 pts.) Find the slope of the curve $x^3 + (x^2 + y^2)^2 = 4xy$ at the point $(-1, 0)$.

