

Math 112 – Winter 2007
Exam 1
January 30, 2007

Name: _____

Section: _____

Student ID Number: _____

1	12	
2	12	
3	14	
4	12	
Total	50	

- You are allowed to use a calculator and one **hand-written** 8.5 by 11 inch page of notes. Put your name on your sheet of notes and turn it in with the exam.
- Turn your cell phone OFF and put it away for the duration of the exam.
- Check that your exam contains all the problems listed above.
- You must show your work on all problems. The correct answer with no supporting work may result in no credit. Unless otherwise indicated, your **final answer** must be correct to two digits after the decimal.
- If you use a guess-and-check, or calculator, method when an algebraic method is available, you may not receive full credit.
- If you need more room, use the backs of the pages and indicate to the grader that you have done so.
- Raise your hand if you have a question.
- **There are multiple versions of the exam.** Any student found engaging in academic misconduct will receive a score of 0 on this exam. In addition, students found engaging in academic misconduct are typically put on academic probation. So DON'T CHEAT! It could serious hurt your career.

..

GOOD LUCK!

2. (12 points) The correct answer with no supporting work receives *no points*. You must show at least one intermediate step. You do not have to simplify your answers.

(a) (4 points) If $f(x) = \frac{\sqrt{x} + 2x^4}{3x}$, find $f'(x)$.

$$f'(x) = \underline{\hspace{10cm}}$$

(b) (4 points) If $y = x^2 \left(\frac{5}{x} + x^6 \right)$, find $\frac{dy}{dx}$.

$$\frac{dy}{dx} = \underline{\hspace{10cm}}$$

(d) (4 points) If $g(x) = \sqrt[3]{x} - 2x^4 + \frac{13}{\sqrt{x}} + 7$, find the slope of the tangent line to $g(x)$ at $x = 1$.

$$\text{slope} = \underline{\hspace{10cm}}$$

4. (12 points) You are given the total revenue function

$$R(q) = q^2 - 3$$

You do not know the total cost function, but you are given the formula for the slope of secant to the cost graph:

$$\frac{C(q_2) - C(q_1)}{q_2 - q_1} = 4q_2 + q_1 + 11$$

(a) (3 points) Determine the value of $C(3.01) - C(3)$.

$$C(3.01) - C(3) = \underline{\hspace{4cm}}$$

(b) (3 points) Expand the expression $\frac{R(4+h) - R(4)}{h}$.

Simplify as much as possible.

$$\frac{R(4+h) - R(4)}{h} = \underline{\hspace{4cm}}$$

(b) (3 points) Find a formula for the derivative of $C(q)$.

$$C'(q) = \underline{\hspace{4cm}}$$