Math 203
Spring 09
Chasse

Name_____

Practice Exam 2

No Calculators/Turn Off Cell Phones

(1) (20 pts) Find the relative maxima, relative minima, inflection points, and intervals of concavity for the following functions

(a)

$$f(x) = 2x + \frac{1}{x-3}$$

(b)

$$h(t) = (t-2)e^{-t}$$

(2) (10 pts) Find the absolute maximum and absolute minimum of the following function on the interval $[-2, 4]$

$$f(x) = 4x^3 - 27x + 12$$

(3) (10 pts) A talented boxer, who wins every bout he enters and has also studied calculus, is trying to figure out how many matches he should enter before retiring. His average pay per match is given in dollars by the function $p = 20000 - \frac{15000}{x}$ where x is the number of matches entered (and won). The total health care costs for repairing the brain damage he endures is given by $C(x) = 500x^2$. After how many matches will he stop?

(4) (10 pts) A California distributor of sporting equipment expects to sell $10,000$ cases of tennis balls during the coming year at a steady rate. Yearly carrying costs (to be computed with respect to the average number of cases in stock during the year) are \$10 per case, and the cost of placing an order with the manufacturer is \$80. Determine the order size that minimizes the total cost.

(5) (11 pts) During the summer months Terry makes and sells necklaces on the beach. Last summer he sold the necklaces for \$10 each and his sales averaged 20 per day. When he increased the price by \$1, he found that he lost 2 sales per day.

(a) Find the demand function, assuming that it is linear.

(b) If the material for each necklace costs Terry \$6, what should the selling price be to maximize his profit?

(6) (4 pts)Compute the partial derivatives, $\frac{\partial f}{\partial x}$ and $\frac{\partial f}{\partial y}$ for the following functions:

(a) $g(x, y) = x^3 - xy + 4y^2x$

(b) $w(x, y) = e^{2xy^2} - e^x + 5y - \frac{5x}{3y}$

(7) (around 5 pts) Potpourri – logarithms, tangent planes, and possible bonus questions.