MATH 211 QUIZ 4 NAME SOLUTIONS

Prof. J. Beachy Friday, 9/27/02 Circle C1(T10) C2(T11) C3(Th11)

1. (5 pts; p 155 #4) For the revenue function $R(x) = 50x - 0.5x^2$ and cost function $C(x) = 4x + 10$, find (a) the profit function $P(x)$, (b) the marginal profit function, and (c) the marginal profit when $x = 20$.

(a) $P(x) = R(x) - C(x) = 50x - .5x^2 - 4x - 10 = -.5x^2 + 46x - 10$

(b) $P'(x) = -x + 46$

(c) $P'(20) = -20 + 46 = 26$

2. (5 pts; p 126 #8) A supply function for a certain product is $S(p) = 0.08p^3 + 2p^2 + 10p + 11$. Find the rate of change of supply with respect to price, dS/dp. What is the rate of change at $p = 3$?

$$\frac{dS}{dp} = .24p^2 + 4p + 10$$

when $p = 3$ we get $.24(9) + 4(3) + 10 = 2.16 + 12 + 10 = 24.16$

3. (5 pts; p 163 #8) Use the product rule to find $f'(x)$ for $f(x) = (7x^6 + 4x^3 - 50)(9x^{10} - 3\sqrt{x})$.
You do not need to simplify your answer.

I prefer to write the product rule as $\frac{d}{dx}(u(x)v(x)) = u'(x)v(x) + u(x)v'(x)$.

$f(x) = (7x^6 + 4x^3 - 50)(9x^{10} - 3\sqrt{x})$.

$f'(x) = (42x^5 + 12x^2)(9x^{10} - 3\sqrt{x}) + (7x^6 + 4x^3 - 50)(90x^9 - \frac{3}{2}x^{-1/2})$ since $\sqrt{x} = x^{1/2}$

4. (5 pts; p 163 #12) Use the product rule to differentiate. You do not need to simplify your answer.

$$\frac{d}{dx}(\sqrt[3]{x} - 5x^2 + 4)(4x^2 + 11x - 5) = \frac{d}{dx}(x^{1/3} - 5x^2 + 4)(4x^2 + 11x - 5)$$

$$= (\tfrac{1}{3}x^{-2/3} - 10x)(4x^2 + 11x - 5) + (x^{1/3} - 5x^2 + 4)(8x + 11)$$