

Math 211 Exam 2 —Nov. 8

November 8, 2004

1(20 pts).

(a) Suppose the marginal cost is $MC(x) = x + 100$, and $C(0) = 50$.
Find the cost function $C(x)$.

(b) Let $f(x) = \int_3^{x^2+1} t^{10} e^{-t} dt$. Find $f'(x)$.

2(20 pts) Suppose that you want to enclose 600 square yards with a rectangular fence and then divide the area in half with a fence parallel to one of the sides. What dimensions require the least amount of fencing.

3 (20 pts) Compute the integrals.

(a) $\int_1^e x^2 \ln x dx.$

(b) $\int \frac{x^2}{x^3+1} dx.$

4 (20 pts) Find the area between the curves $y = \sqrt{x}$ and $g(x) = x^2$ with $0 \leq x \leq 4$.

5 (20 pts) Let $f(x) = \int_1^x \frac{t-1}{t} dt$. Sketch the graph of $y = f(x)$, for $x > 0$.

6(10 pts extra) Find the integral

$$\int \frac{e^x}{e^x + e^{-x}} dx.$$